TECHNICAL REPORT, GEOPHYSICAL SURVEY, LOWER PASSAIC RIVER RESTORATION PROJECT

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SURVEY COMPANY

Aqua Survey Inc.
469 Point Breeze Rd.
Flemington, NJ 08822

ASI Project Number 25-068

June 16, 2006

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GEOPHYSICAL SURVEY,
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This report, as well as all records and raw data were audited and found to be an accurate reflection of the study. Copies of raw data will be maintained by Aqua Survey, Inc., 469 Point Breeze Road, Flemington, NJ 08822.

Kenneth Hayes **Date**
President

James Nickels **Date**
Vice President and Field Project Manager

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I. EXECUTIVE SUMMARY

The primary goal of the geophysical survey was to investigate the surficial and sub-surface geology of the Lower Passaic River from the Dundee Dam to its confluence with Newark Bay. As part of the investigation, targets that may be potential hazards to future dredging operations on the river, if dredging is deemed necessary, were also described.

The survey work encompassed the entire river bottom within the channel between the confluence with Newark Bay and the removed Conrail swing bridge between Newark and Kearny, and from shoreline to shoreline above that point to about one mile below the Dundee Dam where the river was too shallow for the remote sensing equipment to effectively operate (Figure 1). The survey work results were produced in New Jersey State Plane feet NAD83 for the horizontal datum and Mean Lower Water (MLW) for the vertical datum.

The geophysical survey was conducted between April 21, 2005 and June 16, 2005. Technologies and techniques employed included side scan sonar, sub-bottom profiler, fathometer, magnetometer, real-time kinematic differential global positioning (RTK-DGPS), shallow push coring, and deep vibracoring. Five survey lines were initially run longitudinally along the river (with one line being adjacent to each shoreline) using the fathometer, side scan sonar, gradiometer, and sub-bottom profiler. Fifty-one lines across the river were subsequently surveyed using the fathometer and sub-bottom profiler. Laboratory analysis on the shallow push cores included grain size and total organic carbon. Laboratory analysis of the deep cores included grain size, total organic carbon, Atterberg limits, bulk density, moisture content, and percent solids.

An Innerspace Technologies model 455 fathometer was used to conduct the hydrographic survey. A Trimble RTK-DGPS system was used for both horizontal positioning and vertical positioning in order to collect tidal corrections. Horizontal positioning was collected from the RTK-DGPS and electronically paired with the soundings from an Innerspace Technologies IT-455 fathometer in Hypack Max 4.3a survey control software. Following the survey, the data set was processed and point plotted with elevations presented in MLW.

A Marine Sonics 600-khz side scan sonar system was used for this survey. Range scale was set to 50 meters, with approximately 100 foot lane spacing, which resulted in greater than 200 percent coverage of the riverbed (the entire riverbed being insonified at least twice). Following the survey, the individual records were analyzed to detect any targets that might pose a threat to future dredging operations, if dredging is deemed necessary. Forty sonar targets were found, 16 of which were probably cars, which could pose a potential problem to future dredging operations, if dredging is deemed necessary. Locations of the probable cars were given to the New Jersey State Police for further investigation. One wreck was found that should be investigated further, should future operations impact the site. The sonar records were mosaiced using Chesapeake Technologies SonarWeb Pro software to provide a better overall view of the project area. The sonar data were processed with Quester Tangent SIDEVIEW software in order to better classify surficial seabed types. A simplified surficial sediment texture map was created based on the side scan sonar images, Quester Tangent categorization, and shallow push core results.

Shallow sediment cores were taken and analyzed to help ground-truth the images in the side scan sonar as well as to help identify the classification results from Quester Tangent. Five shallow cores were taken approximately every half mile along the length of the project area resulting in 170 cores. Following analysis of the side scan sonar records, an additional 105 locations were chosen to ground truth based on differential appearances in the side scan sonar records.

Deep sediment cores were taken and analyzed to help ground-truth the sub-bottom profiler results and help characterize the subsurface geology. Three vibracores were taken at each of the 17 transects that were chosen along the length of the river. Transect spacing was approximately every mile, though the actual locations of the transects were chosen based on the sub-bottom reflectors detected during the remote sensing survey. Rossfelder P-3, P-4, and VT-6 vibracorers were used in order to get penetrations up to 33 feet below the riverbed. The Holocene silt layer thickness varied from none to almost 19 feet, with the greatest thickness being in the lowest four miles of the river.

An Edgetech X-STAR sonar system with a SB-216S towfish was used to collect the chirp sub-bottom profiling data during the survey along the Lower Passaic River. The principal objective of the survey was to collect chirp images to characterize subsurface sediments beneath the river bed and to use the chirp images to aid in the selection of sites where shallow (<3 feet) and deeper (>12-20 feet) core samples could be collected. During the survey, the towfish was towed at a depth between 3 to 5 feet to minimize interference from the vessel and to help avoid hitting rocks and other debris.

The maximum depth of penetration of the chirp sonar was on the order of 20 feet with the greatest penetration depths occurring along the Kearny Point Reach. Additional areas along the river where depths of penetration deeper than 10 feet were observed included the area near the Arlington and Belleville Reaches. Based on an analysis of the chirp data, approximately 5%, or 4.5 out of the 85 miles of trackline surveyed along the Lower Passaic River had no significant penetration of chirp sound energy into the sub-bottom. Between 70 and 75% of the region surveyed was characterized by penetration into the sub-bottom to depths between 1 to 9 feet. Most of this region had penetration depths less than 6 feet. As documented in the shallow and deep cores, the predominant sediment type was silt and the major variations in the sediments were the amount of silt relative to clays, sands, and gravels. These variations could be correlated with chirp sub-bottom reflections. Of the shallow (<1 to 2 feet) chirp reflection events, the occurrence of "soft" silts overlying either firmer/tighter silts or silts with fine sands was one of the most pronounced events observed.

The chirp sub-bottom profiling was of limited success in terms of the ability to use the profiles to generate geologic cross-sections of the sub-bottom sediments. There was a great deal of variability and a general lack of continuity of the chirp reflections over even the relatively short distances (50 to 200 feet) between the deep cores along individual transects. Furthermore, with the exception of the Kearny Point Reach near Transect #1A, deeper reflection events in the chirp data could not be "ground-truthed" by correlation with sediments due to the lack of penetration to these depths by the deep cores that were collected.

The principal limiting factors to the quality of the chirp data were the relatively shallow water depths, the presence of organic- gaseous materials in the shallow sub-bottom, and the similar nature of the sub-bottom sediments in the project area. The shallow waters exacerbated the problem of multiples in the sonar data. Multiples are generated by sound energy reverberating in the water column as opposed to penetrating into the sub-bottom. In the chirp profiles, the presence of multiples, which essentially parallel the river bottom, mask the presence of possible deeper reflection events. Depth of penetration of the chirp acoustic signal was limited by the presence of organic leaf material and/or organic-rich silts along the river bottom. Decomposition of the leafy and organic material in these sediments produces gas. Since gases are characterized by very high acoustic impedance (the product of a material's density and sound velocity) contrasts with surrounding materials, when trapped, they limit the passage of sound waves deeper into the sub-surface. The predominance of silts with varying amounts of sands, clays, and gravels meant that there was not a great deal of variability in acoustic impedance in the sub-bottom sediments. This in turn, would limit the occurrence of high-amplitude chirp reflections that could be used to delineate significant changes in sediment types. This was further exacerbated by the fact that in this riverine environment changes in sediment types are sometimes gradational rather than discrete and thus large changes in acoustic impedance are not generated.

The magnetic survey was conducted using dual Geometrics G-882 marine cesium magnetometer systems configured both as individual magnetometers and as a horizontal gradiometer in order to detect exposed and buried ferrous objects within the project area. During the survey, the sensors were towed at several different depths to get them as near the bottom as possible and to ensure the sensors were not detecting the vessel itself. The Lower Passaic River is a very difficult area in which to conduct a magnetic survey due to the nature of the geology, the large amount of ferrous materials along the banks, as well as the number of bridges that can create false targets, as well as masking true targets. Through the processing of the data as both individual magnetometers and as a horizontal gradiometer, the results of the magnetic survey were much more accurate than from a single magnetometer. The gradiometer survey identified 147 magnetic anomalies that were detected during the survey. Of those, 9 were associated with the non-car side scan sonar targets. The ability to detect magnetic anomalies very close to metal bulkheads and bridges was made possible through the surveying and processing techniques used. Of the magnetic anomalies that were not associated with a sonar target, none were found to have signatures indicative of a potentially significant submerged cultural resource that would be impacted by future dredging operations, if dredging is deemed necessary.

One of the targets located, sonar target "Wreck" with associated magnetic anomaly Mag-91, was found to have an image indicative of a potentially historically significant submerged cultural resource. Further investigation may be necessary to determine the identity and potential significance of the wreck.

Figure 1. Lower Passaic River project area from Newark to Garfield, NJ.

II. TEST ADMINISTRATION

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B. Survey Company

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C. Dates of Survey

Date of Survey Initiation:	April 21, 2005
Date of Survey Completion:	June 16, 2005

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III. MATERIALS, METHODS, AND RESULTS

A. Horizontal and Vertical Positioning

All aspects of the remote sensing survey were conducted using a real-time kinematic differential global positioning system (RTK-DGPS). This system consisted of a stationary base station operating over a precisely know control point. Positioning corrections calculated by the base station were transmitted at 10 times per second via radio modem to another differential global positioning system (DGPS) receiver on the survey vessel. This allows the positioning accuracy for the survey vessel to be on the order of 1-cm in the horizontal and 2-cm in the vertical planes. In order to ensure constant communication between the base station and rover and to minimize the effects of geoidal/ellipsoidal model variations, it was decided to establish a series of base station locations along the length of the project area. Six separate locations were used. As the locations of National Geodetic Survey (NGS) benchmarks were not always ideal, new base station locations were surveyed in prior to the commencement of remote sensing operations. One base station location was established over NGS benchmark AI7796; the remaining 5 were relocated to better positions.

In order to establish these new locations, the base station, consisting of a Trimble 5700 24-channel dual frequency GPS receiver, Trimble TSCe survey controller, and Trimble Trimmark 3, was set-up on a known NGS benchmark. The rover, consisting of a Trimble MS-750 9-channel dual frequency GPS receiver and Teledyne radio modem, was set-up over the spot to become a future base station location. The position of the rover was recorded, and the base station was moved to another known NGS benchmark. Once communication was again established between the base station and rover, the position of the rover was checked against the previous coordinates determined for the future base station location to ensure the accuracy of the coordinates. The base station locations used during the survey can be seen in Figure 2.

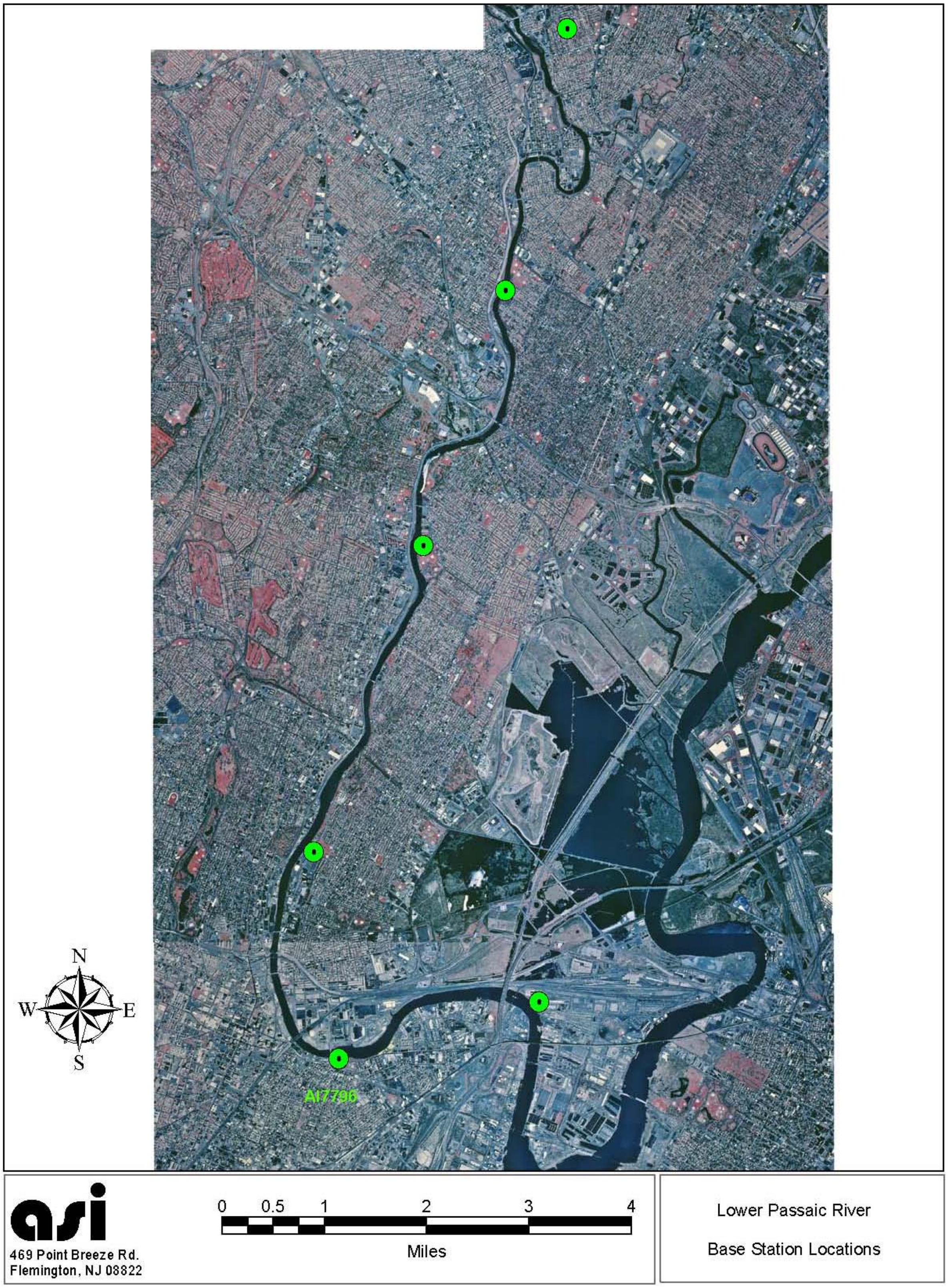

Figure 2. Locations of RTK-DGPS base stations.

B. Bathymetric Data Collection

A bathymetric survey was conducted along the entire length of the project area. Five lines were initially run longitudinally along the river with one line adjacent to each shoreline. Fifty-one cross lines were run in conjunction with the sub-bottom profiler. Horizontal positioning was collected from the RTK-DGPS and electronically paired with soundings from an Innerspace Technologies IT-455 fathometer in Hypack Max 4.3a survey control software at a rate of 10 points per second. The survey was conducted in New Jersey State Plane feet NAD 83 horizontal datum and vertical datum NAVD88.

Prior to the start of the bathymetric survey, a latency test was run to determine what, if any, latency there was in the system to ensure accurate sounding positioning. The latency test revealed no latency. Prior to the commencement of survey operations each day, a bar check was conducted to adjust for draft and speed of sound in order to ensure accurate sounding data. A bar check was also conducted at the end of each day to be sure the settings continued to be correct. The antennae for the RTK-DGPS was mounted directly above the transducer, eliminating any positioning offset errors.

Positioning was lost periodically under bridges, but was quickly regained. Positions that were collected when the RTK-DGPS was not in 'fix' mode were discarded as the horizontal or vertical corrections are not accurate or reliable enough to be included in the survey. These occurrences can be seen as gaps in the sounding data point plot.

Post processing involved correcting the sounding data for tides based on the RTK-DGPS elevations. The vertical data were then corrected to Mean Low Water through a correction from the nearest National Geodetic Service tidal benchmark to where the point was collected, PID=KV0266 or KV3412. The data were then sorted to eliminate points closer than 20 feet apart and to reduce the data to an X, Y, Z file. Finally, the sorted data were point plotted and annotated on geo-referenced AutoCAD and GIS drawings.

C. Gradiometer Data Collection and Results

A gradiometer survey was conducted in order to detect the presence of submerged ferrous debris that could pose a hazard to future dredging operations, if any. The gradiometer also serves to help detect the presence and locations of buried pipes and cables. The gradiometer survey complemented and aided in the interpretation of the side scan sonar survey results regarding debris and potentially significant historic submerged cultural resources. The survey methodology was designed to provide data indicating the position and relative size of ferrous targets in the project area, as well as archaeological data essential for complying with the National Historic Preservation Act of 1966, as amended, through 1992 (36 CFR 800, *Protection of Historic Properties*) and the Abandoned Shipwreck Act of 1987 (*Abandoned Shipwreck Act Guidelines*, National Park Service, *Federal Register*, Vol. 55, No. 3, December 4, 1990, pages 50116-50145).

Due to localized geological variations, it was decided to conduct the survey using dual Geometrics G-882 marine cesium magnetometer systems capable of plus or minus 0.01 gamma resolution configured as both individual magnetometers and a horizontal gradiometer. The sensors were separated by 2 meters horizontally, and towed the exact same distance behind the survey vessel. A vertical gradiometer configuration allows for good depth resolution of targets as well as enhancing shallow magnetic features while offering less detail for linear objects. A horizontal configuration of a gradiometer allows for better delineation of linear objects such as cables and pipelines, though it offers less detail for deeper features (*Field Analytical Technologies Encyclopedia*, "Magnetics for Environmental Applications," U.S. EPA Technology Innovation Office, January, 2003). As this survey was designed to detect linear features such as cables and pipelines, as well as to detect large shallow objects that pose a possible threat to future dredging operations, if dredging is deemed necessary, it was decided that the horizontal configuration was best suited for this application. Survey lines were run at approximately 100-foot intervals to ensure complete coverage of the project area. Data were recorded at 0.1 second intervals and electronically paired with positioning data from the RTK-DGPS using an onboard computer running Hypack Max 4.3a survey software.

To ensure reliable target identification and assessment, analysis of the magnetic data were initially carried out as it was generated. Due to large number of bridges and the fact that significant portions of the shoreline have been protected with sheet piling and other debris-containing ferrous materials, notations were made during the survey to help eliminate the false identification of targets during post-processing. Significant unidentified magnetic anomalies were marked as targets during the survey and were re-surveyed using the magnetometer to better determine the size and characteristics of the anomaly.

Post-processing of the data involved examining each survey line individually and annotating anomalies detected. The two individual magnetometer results were processed together for gradiometer results. Gradiometer processing involved combining the data into an Excel file to calculate the gradiometer field readings. These readings were obtained by subtracting the gamma values of magnetometer two from magnetometer one. In Microsoft Excel, a distance versus gradiometer chart was generated to identify potential targets. Each target was evaluated according to intensity, duration and signature characteristics. These results helped minimize the influence of external natural causes on the magnetometer data and better resolve individual targets. Using contouring software, magnetic data generated during the survey was contour plotted at 50 gamma intervals for analysis and accurate location of the material generating each magnetic anomaly as well as determining the presence of clusters of targets. Data generated by the remote sensing equipment was used to support an assessment of each magnetic signature regarding the potential hazard to future dredging operations, if dredging is deemed necessary. Analysis of each target signature also included consideration of magnetic characteristics previously demonstrated to be reliable indicators of historically significant submerged cultural resources. Of the magnetic anomalies that were not associated with a sonar target, none were found to have signatures indicative of a potentially significant submerged cultural resource that would be impacted by future dredging operations, if dredging is deemed necessary. All targets are listed and described in Table 1 and maps have been produced that show their locations within the project area (Figures 3 to 38). Some targets were detected on more than one survey line. In those cases, the target will have more than one entry in the table. The table includes the location of the target as derived from a combination of signature interpretation and magnetic contouring. This location is either highlighted in bold if it was from an individual signature or it is described as the refined position in the table.

The gradiometer survey revealed 147 distinct magnetic anomalies, 9 of which were associated with non-car side scan sonar targets. The magnetic anomalies associated with the cars in the side scan sonar records have not been included. Of those remaining 138 magnetic anomalies, 46 have magnetic signatures indicative of larger shallow objects. The remaining 92 magnetic anomalies have signatures indicative of large-deep objects or smaller shallow targets. The size of an object that can be considered a possible obstruction to future dredging operations from a mechanical standpoint depends on the dredging methodology used. Prior to future operations, if any, the dredger should be consulted regarding mass of what is to be considered an obstruction to their operations. The magnetic targets to be impacted should be evaluated against this factor and the proposed dredge depth, and investigated further should they be determined to be an obstruction.

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
1	4_1533	12n116235	Negative	116.9	235	596975.7	685247.4	Probably deeper
2	8_1442	18m82g49	Multi-Component	81.82	49	596760.2	685650	Probably small/shallow
3	4_1533	11d217g89	Dipolar	217.39	89	596975.6	685749.8	Probably large/shallow
4	6_1507	13m56g153	Multi-Component	56.17	153	597224.2	688122.3	Probably deeper
5	4_1533	10n51g89	Negative	51.37	89	597912.6	690101.2	Probably small/shallow
6	4_1533	9n51g89	Negative	49	43	597999.8	690479.2	Probably small/shallow
7	4_1533	8d222g144	Dipolar	222.3	144	598316.5	692471.1	Probably deeper
8	4_1533	6m761g241	Multi-Component	761.15	241	598285 598287.9	694278.7 694209.1	Associated with SSST-17
9	4_1533	4d109g77	Dipolar	108.9	77	595926.5	695779.7	Probably small/shallow
10	12_1641	26p530g243	Positive	530.15	243	595787.9	695400.4	Probably deeper
11	14_1633	32n68g53	Negative	67.93	53	594903.5	695357.6	Probably small/shallow
12	12_1627	22m217g104	Multi-Component	217.72	104	594543.2	695260.4	Probably small/shallow
13	14_1633	33m79g47	Multi-Component	79.37	47	594226.1	695274.1	Probably small/shallow
14	4_1533	3n149g93	Negative	149.18	93	593496.2	695533.9	Probably small/shallow
15	4_1533	2d94g69	Dipolar	94.45	69	592393	695259.7	Probably small/shallow
16	4_1533	1d135g84	Dipolar	135.83	84	592061.7	695130.1	Probably small/shallow
17	10_1601	21p94g831	Positive	94.09	831	592116.3	694870.5	Probably deeper
18	12_1340	63p286g226	Positive	285.87	226	590920.3	693484.7	Probably deeper
19	8_1362	53n46g529	Negative	46.5	529	590585.6	693145.6	Probably deeper
20	10_1411	55d1194g124	Dipolar	1,193.55	124	590595.6	693006.2	Associated with SSST-13
21	12_1340	65d121g178	Dipolar	121	178	589818.7	692375.8	Probably deeper
22	12_1340	66d287g50	Dipolar	287.37	50	589340.5	692269.8	Probably large/shallow
23	4a_1329	40n80g109	Negative	79.52	109	588738.7	692590.5	Probably deeper
24	6_1428	46p53g73	Positive	53.22	73	588506.4	692484.6	Probably small/shallow
24	8_1361	52p84g96	Positive	83.92	96	**588591.3**	**692394**	Probably small/shallow
24	10_1411	56d84g75	Dipolar	83.97	75	588707	692331.6	Probably small/shallow
25	4a_1328	39d246g102	Dipolar	246.91	102	587022.7	692490	Probably large/shallow
25	6_1428	45m254g975	Multi-Component	254.22	975	586655.3 587022.4	692530 692425.7	Probably large/shallow
25	8_1360	51m271g1154	Multi-Component	270.58	1,154	586765.7 587008.2	692462.7 692387.8	Probably large/shallow

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
25	12_1340	67m1541g996	Multi-Component	1,541.83	996	586529.8 586961.1	692476.8 692301.8	Probably large/shallow
26	10_1411	57m878g975	Multi-Component	877.94	975	586914.2 586583.7	692358.3 692489.3	Associated with SSST-14
27	4a_1327	38p994g82	Positive	993.88	82	586586.3	692643.6	Probably large/shallow
28	10_1411	58m192g83	Multi-Component	191.93	83	586227.9	692735.9	Probably large/shallow
29	6_1428	43d114g146	Dipolar	114.36	146	585486.8	694460.8	Probably deeper
30	10_1411	60p79g76	Positive	79.08	76	585209.5	694802.7	Probably small/shallow
30	8_1359	50m97g123	Multi-Component	96.75	123	585282.2	694828	Probably small/shallow
30		Refined Position				585255	694820	Probably small/shallow
31	8_1358	49d73g145	Dipolar	72.81	145	585249.7	694955.8	Probably large/shallow
31	10_1411	61p610g143	Positive	609.98	143	585168.6	694961	Probably large/shallow
31		Refined Position				585194	694959	Probably large/shallow
32	8_1357	48d55g128	Dipolar	55.31	128	585146	695207.7	Probably deeper
33	10_1411	62p48g245	Positive	48.6	245	584771.3	696068.2	Probably deeper
34	4a_1324	35d288g106	Dipolar	288.17	106	584946.2	696227.7	Probably large/shallow
35	6_1428	41p103g167	Positive	102.54	167	584859.4	698317.4	Probably deeper
35	8_1357	47n127g71	Negative	127.34	71	584846.1	698388.4	Probably deeper
35	4a_1324	34p392g169	Positive	391.85	169	584923.3	698351.5	Probably deeper
35		Refined Position				584897	698366	Probably deeper
36	4_0854	70n14g128	Negative	143.58	128	585091.5	699468.6	Probably deeper
37	9_0943	92p68g134	Positive	68.27	134	584930	699528.8	Probably deeper
38	12_0957	95m190g170	Multi-Component	190.65	170	584950.1	700346.8	Associated with SSST-10
39	6_0912	82d73g113	Dipolar	73.27	113	586503.7	703392.1	Probably deeper
40	6_0912	81d66g75	Dipolar	65.59	75	586996.9	704144.7	Probably small/shallow
41	12_0957	98p363g299	Positive	363.71	299	587157.5	705413.2	Probably deeper
42	6_0912	77p55g47	Positive	54.84	47	587599.6	705700.8	Probably small/shallow
43	8_0926	85d58g62	Dipolar	58.55	62	587561.3	705993.4	Probably small/shallow
44	4_0854	72m1661g86	Multi-Component	1,661.86	86	587777.3	706173.3	Probably large/shallow
44	6_0912	76m3907g113	Multi-Component	3,907.32	113	**587803.8**	**706184.4**	Probably large/shallow
45	8_0926	86n66g96	Negative	66.21	96	587690.1	706273.3	Probably small/shallow
46	8_0926	87p61g102	Positive	61.02	102	588491.3	707424.4	Probably small/shallow

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
47	4_0854	73d63g171	Dipolar	62.59	171	589610.1	708918.5	Probably deeper
47	9_0943	90m143g273	Multi-Component	143.36	273	589573.6	709094.9	Probably deeper
47	12_0957	99m3506g149	Multi-Component	3,506.29	149	**589526.6**	**708917.7**	Probably deeper
48	6_0912	75d96g74	Dipolar	96.2	74	589614.5	711134.1	Probably small/shallow
49	4_1017	103p245g65	Positive	245.34	65	590168.6	712253.6	Probably small/shallow
50	8_1058	133m456g256	Multi-Component	456.31	256	590156.7 590117.9	712463.4 712398.8	Probably deeper
50	6_1124	132m1630g199	Multi-Component	1,630.30	199	590162.1	712391.6	Probably deeper
50		Refined Position				590158	712409	Probably deeper
51	6_1124	131n208g162	Negative	208.42	162	590258.6	712590.6	Probably deeper
51	8_1058	134p250g192	Positive	250.29	192	590229.3	712627.5	Probably deeper
51		Refined Position				590243	712608	Probably deeper
52	4_1017	104m553g73	Multi-Component	552.71	73	590433.4	712785.6	Probably large/shallow
53	6_1124	130d51g117	Dipolar	51.21	117	590619.1	713144.8	Probably large/shallow
53	4_1017	105p127g88	Positive	127.26	88	590622.1	713084.3	Probably large/shallow
53		Refined Position				590613	713103	Possible Sonar Image
54	10_1143	143m92g104	Multi-Component	91.94	104	590591.6	713352.3	Probably deeper
55	4_1017	106p663g89	Positive	663	89	590786.7	713316.8	Probably large/shallow
56	8_1058	135n54g80	Negative	54.27	80	590712.3	713414.6	Probably small/shallow
56	10_1143	144p105g62	Positive	104.63	62	590679.9	713472.1	Probably small/shallow
56		Refined Position				590688	713540	Probably small/shallow
57	12_1039	178n64g107	Negative	63.70	107	590803.6	713683.1	Probably small/shallow
58	4_1017	107d173g68	Dipolar	173.14	68	590980.4	713566	Probably small/shallow
59	4_1017	108p304g64	Positive	304.35	64	591118.6	713770.8	Probably small/shallow
60	6_1124	129n57g107	Negative	57.29	107	591219.3	714053.5	Possible Sonar Image
61	12_1039	176d89g71	Dipolar	88.82	71	591214.3	714311.3	Probably small/shallow
62	12_1039	177d103g79	Dipolar	103.01	79	591152.3	714190.6	Probably small/shallow
63	12_1039	173d77g79	Dipolar	77.36	79	591506.8	714842.5	Probably small/shallow
64	8_1058	136p156g108	Positive	155.70	108	591729.1	715087.4	Probably deeper
64	10_1143	145p232g176	Positive	232.11	176	**591692.9**	**715097.4**	Probably deeper
65	12_1039	172d66g87	Dipolar	65.55	87	591621.4	715069.8	Probably small/shallow

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
66	4_1017	109d1114g153	Dipolar	1,114.14	153	591818.8	715090.3	Probably large/shallow
67	4_1017	110d5511g96	Dipolar	5,511.20	96	592205.6	715655.9	Associated with SSST-3
68	4_1017	111m202g86	Multi-Component	202.45	86	592387.2	716063.9	Probably small/shallow
69	6_1124	128n44g232	Negative	44.41	232	592351	716319.5	Probably deeper
70	8_1058	138p48g64	Positive	47.66	64	592293.1	716450.4	Probably small/shallow
71	12_1039	170p104g55	Positive	104.26	55	592148.8	716676.7	Probably small/shallow
72	6_1124	127d74g115	Dipolar	74.44	115	592077	717367.1	Possible Sonar Image
73	6_1124	126d89g142	Dipolar	86.18	142	592044.7	717486.8	Probably deeper
74	10_1143	148d522g142	Dipolar	521.82	142	591833.4	718300.4	Probably deeper
75	12_1039	166m571g149	Multi-Component	570.61	149	591758.3	718540.7	Probably deeper
76	4_1017	112n147g101	Negative	147.37	101	592219.1	719265.8	Probably large/shallow
76	6_1124	125n562g91	Negative	562.22	91	592157.3	719207.1	Probably large/shallow
76		Refined Position				592188	719234	Probably large/shallow
77	4_1017	113d1015g98	Dipolar	1,015.16	98	592234	719614.3	Associated with SSST-1
78	10_1143	150d216g96	Dipolar	216.25	96	592129.8	721138.7	Probably large/shallow
79	6_1124	123d98g63	Dipolar	98.43	63	592283.5	721421.8	Probably small/shallow
80	4_1017	115m971g150	Multi-Component	970.65	150	592288.7	721653.8	Probably large/shallow
81	10_1143	151d84g113	Dipolar	84.17	113	592233.2	721738.3	Probably deeper
82	8_1058	140p57g50	Positive	56.99	50	592304.8	721833.8	Probably small/shallow
83	8_1058	141m441g216	Multi-Component	440.62	216	593007.2	723286	Pipeline or Cable
83	6_1124	122m467g191	Multi-Component	467.29	191	593044.8	723212.3	Probably deeper
83	12_1039	162m535g168	Multi-Component	534.98	168	592924.5	723364.4	Pipeline or Cable
83	10_1143	152m726g269	Multi-Component	725.6	269	592971.7 593033	723320.6 723348.2	Pipeline or Cable
84	4_1017	117n971g83	Negative	971.21	83	593818.2	723494	Probably large/shallow
85	6_1124	121d489g62	Dipolar	489.33	62	**593912**	**723522.1**	Probably large/shallow
85	4_1017	118d2105g123	Dipolar	2,105.32	123	593911.9	723521.6	Probably large/shallow
86	10_1143	153n374g51	Negative	374.17	51	593793.7	723637	Probably large/shallow
87	10_1143	154p488g111	Positive	487.67	111	594099.3	723712.4	Probably large/shallow
87	12_1039	160n2298g122	Negative	2,297.64	122	594036.2	723753.3	Probably large/shallow
87		Refined Position				594064	723746	Probably large/shallow

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
88	12_1039	159d225g66	Dipolar	224.97	66	594192.4	723798.8	Probably large/shallow
89	10_1143	155n94g86	Negative	93.51	86	594529.2	723842.4	Probably large/shallow
89	12_1039	158m1704g201	Multi-Component	1,703.55	201	594462.9 594551.3	723874 723891.4	Probably large/shallow
89		Refined Position				594522	723914	Probably large/shallow
90	12_1039	157d314g76	Dipolar	313.59	76	594665.9	723924	Probably large/shallow
91	12_1039	156m921g147	Multi-Component	920.58	147	594863.7	723983.6	Probably large/shallow
92	4_1017	119n57g88	Negative	56.92	88	595848.8	724302.1	Probably small/shallow
93	6_1257	210p175g62	Positive	174.82	62	596600.5	725748.1	Probably small/shallow
94	4_118	191n78g115	Negative	77.53	115	596981.8	727202.1	Probably deeper
95	12_1141	237d92g73	Dipolar	91.82	73	596914	727823.1	Probably small/shallow
96	12_1141	238d267g114	Dipolar	266.82	114	596855.3	728577.2	Associated with SSST-22
97	4_118	190m1459g180	Multi-Component	1,459.21	180	596670.2	729276.3	Probably deeper
98	10_1230	219d556g85	Dipolar	556.04	85	596496	729486.6	Probably large/shallow
99	12_1141	241m816g117	Multi-Component	816.47	117	596413	729635.9	Probably large/shallow
100	12_1141	242n134g66	Negative	133.73	66	596398.2	729701.5	Probably small/shallow
101	10_1230	220n418g143	Negative	417.95	143	596341.4	729939.9	Associated with SSST-19
101	12_1141	243d1886g141	Dipolar	1,886.43	141	**596321.2**	**729911.9**	Associated with SSST-19
102	6_1257	208n59g117	Negative	58.92	117	596721.9	732143.9	Probably deeper
103	10_1230	222d54g176	Dipolar	53.76	176	596626.2	732234.4	Probably deeper
104	12_1141	245n225g67	Negative	224.84	67	596598	732381.4	Probably large/shallow
105	4_118	188p222g138	Positive	221.77	138	597187.5	734160.4	Probably deeper
106	6_1257	206m63g106	Multi-Component	63.46	106	597199.8	734299.1	Probably deeper
107	6_1257	205d67g129	Dipolar	66.86	129	597313.5	734586.3	Probably deeper
108	4_118	187d144g106	Dipolar	143.8	106	597492.9	735165	Probably large/shallow
108	6_1257	204n232g93	Negative	231.8	93	597467.7	735192.3	Probably large/shallow
108		Refined Position				597478	735182	Probably large/shallow
109	10_1230	224n74g104	Negative	73.75	104	597412.5	735546.5	Probably deeper
110	10_1230	225p100g126	Positive	99.93	126	597388.2	735901.5	Probably deeper
111	10_1230	226m330g105	Multi-Component	330.15	105	597331	736206.5	Probably large/shallow
112	6_1257	203m226g96	Multi-Component	226.21	96	597310.6	736612.6	Probably large/shallow
113	10_1230	228p105g169	Positive	104.97	169	597214.4	736967.8	Pipeline or Cable

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
113	4_118	185p349g177	Positive	348.69	177	597317.1	736931.1	Pipeline or Cable
113	6_1257	202p1269g182	Positive	1,268.68	182	597318.3	736925.7	Pipeline or Cable
113	8_1206	215n2801g216	Negative	2,800.73	216	597261.9	736947	Pipeline or Cable
114	6_1257	200n78g86	Negative	77.54	86	597384.8	737456	Probably small/shallow
115	12_1141	249p61g122	Positive	61.01	122	597328.2	737661.4	Probably deeper
116	6_1257	199p127g115	Positive	126.88	115	597512.8	737893.5	Probably deeper
116	8_1206	213d146g110	Dipolar	146.33	110	597472.2	737912.4	Probably deeper
116		Refined Position				597495	737907	Probably deeper
117	6_1257	198d680g96	Dipolar	680.36	96	597588.5	738045.5	Probably large/shallow
118	10_1230	231p109g226	Positive	109.09	226	598982.3	738319.4	Probably deeper
118	12_1141	253p346g172	Positive	346.26	172	**598992.4**	**738335.7**	Probably deeper
119	4_118	184m544g53	Multi-Component	543.67	53	599194.3	737916.2	Probably large/shallow
120	6_1257	197d1076g100	Dipolar	1,076.06	100	599268.7	737684.6	Possible Sonar Image
121	12_1141	254d218g163	Dipolar	218.31	163	599369.6	737637.5	Probably deeper
122	6_1257	196m230g100	Multi-Component	229.65	100	599269.9	737594.6	Probably large/shallow
123	4_118	183p330g159	Positive	329.58	159	599254.6	737354.7	Possible Sonar Image
124	8_1004	263p54g50	Positive	54.04	50	600192.2	736736	Probably small/shallow
125	14_1028	280m110g77	Multi-Component	109.93	77	600442	736897.1	Probably small/shallow
125	6_0956	262m111g81	Multi-Component	111.03	81	600464.5	736907.8	Probably small/shallow
125		Refined Position				600456	736898	Probably small/shallow
126	14_1028	281d327g96	Dipolar	326.71	96	600616.9	737177.5	Probably large/shallow
127	6_0956	261d669g80	Dipolar	668.79	80	600831	737230.8	Probably large/shallow
128	10_1013	276m463g65	Multi-Component	462.57	65	600641.2	737485.3	Probably large/shallow
129	12_1020	277m556g68	Multi-Component	555.76	68	600674.9	737741.7	Probably large/shallow
130	8_1004	264d76g75	Dipolar	75.95	75	600827.3	738426.1	Probably small/shallow
131	10_1013	275d141g79	Dipolar	141.18	79	600797.6	738527.6	Probably small/shallow
132	6_0956	260n129g90	Negative	129.08	90	600852	738694.6	Probably small/shallow
133	8_1004	266d79g75	Dipolar	78.62	75	600833.2	738831.6	Probably small/shallow
134	14_1028	282p123g50	Positive	123.11	50	600886	738842.2	Probably small/shallow
135	14_1028	283m1843g75	Multi-Component	1,842.75	75	600888	738942.4	Probably large/shallow
136	8_1004	267d410g60	Dipolar	410.15	60	600836.3	738984	Probably large/shallow

Table 1 – Magnetic Anomalies

Mag Target	Lane	Name	Type	Gamma	Distance	Easting	Northing	Description
137	6_0956	259d80g112	Dipolar	80.31	112	600746.5	739551.1	Probably deeper
138	14_1028	284p82g50	Positive	82.39	50	600639.6	739728.4	Near SSST-23, Probably large/shallow
138	6_0956	258d1759g57	Dipolar	1,758.77	57	**600624.1**	**739735**	Near SSST-23, Probably large/shallow
139	8_1004	268d217g51	Dipolar	217.02	51	600554.9	739749.8	Probably large/shallow
140	12_1020	278d2575g55	Dipolar	2,574.77	55	600333.8	739811.6	Probably large/shallow
141	8_1004	269m281g80	Multi-Component	280.53	80	600303.1	739980.6	Probably large/shallow
142	14_1028	285p256g60	Positive	256.13	60	600288.4	740049.4	Probably large/shallow
143	10_1013	273m97g105	Multi-Component	97.37	105	599778.6	740255.5	Probably deeper
144	14_1028	286n216g50	Negative	215.93	50	599675.8	740530.8	Probably small/shallow
145	10_1013	272d175g62	Dipolar	174.82	62	599476.9	740831.9	Probably small/shallow
146	10_1013	271m474g52	Multi-Component	473.72	52	599446.6	740941.8	Probably large/shallow
147	10_1013	270d1263g85	Dipolar	1,262.97	85	599402.1	741121	Probably large/shallow

Table 1. Table of Magnetic Anomalies. Targets detected on multiple lanes have either a refined position indicating where the material generating the signature is located or the probable target location is in bold under the individual target description.

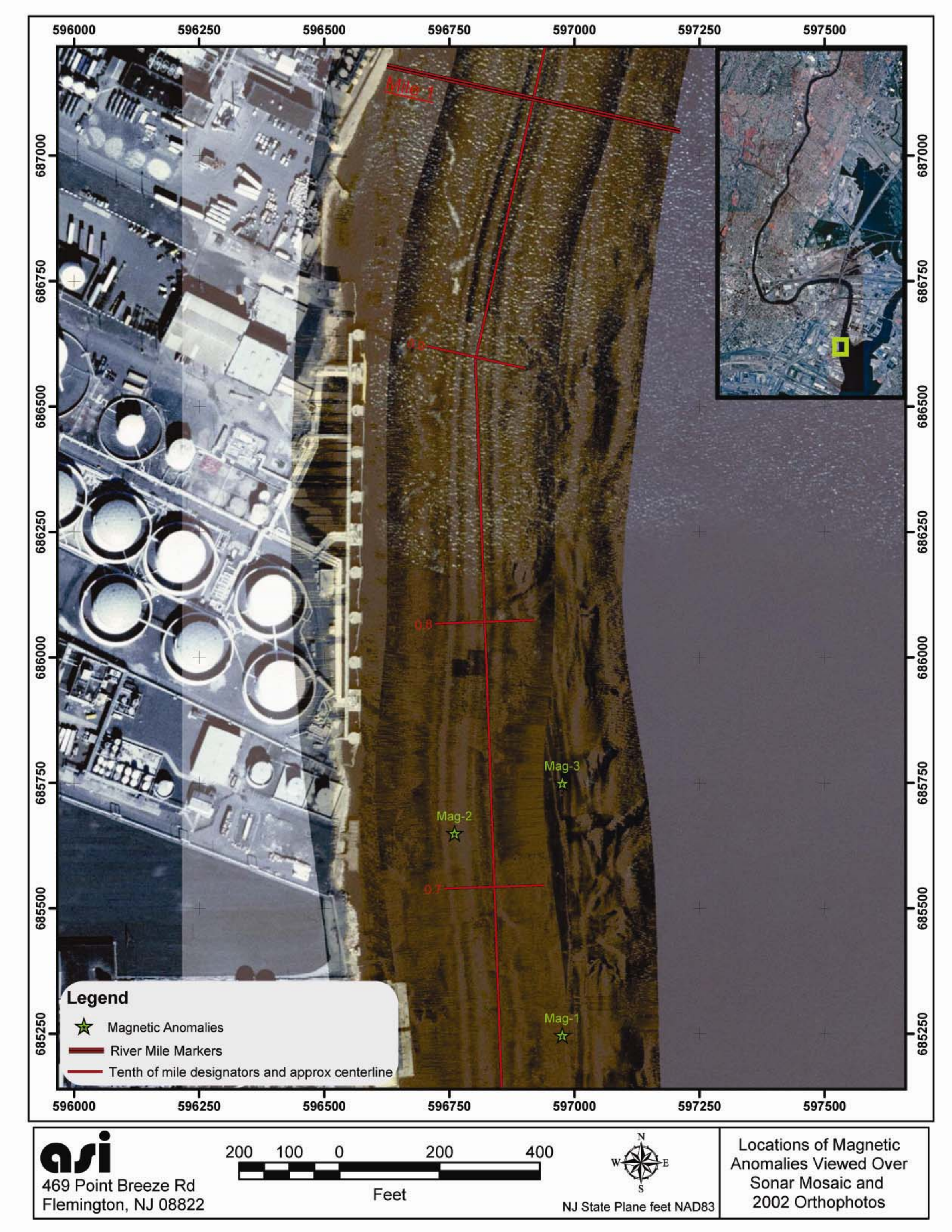

Figure 3. Locations of magnetic anomalies Mag-1 to Mag-3.

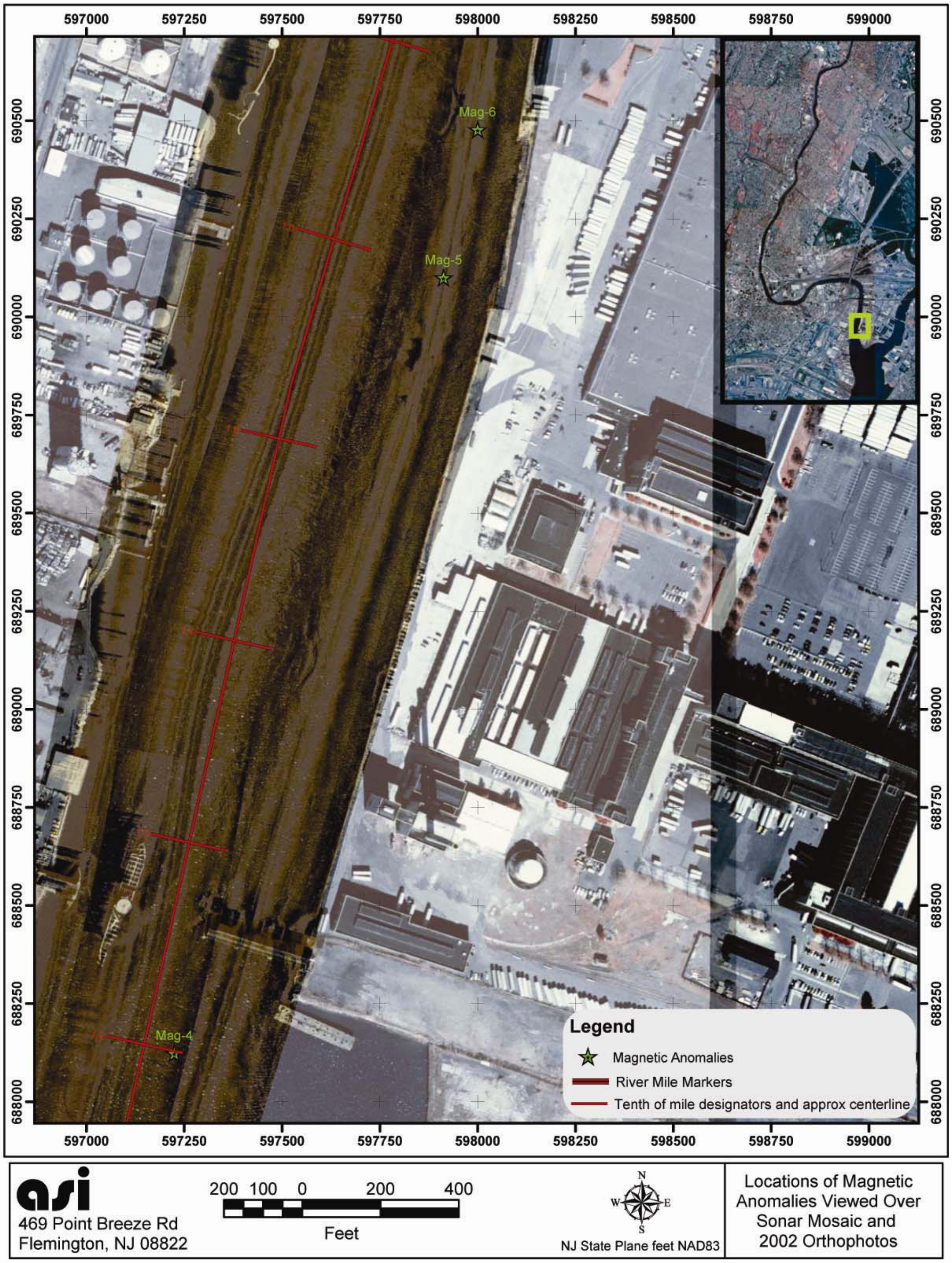

Figure 4. Location of magnetic anomaly Mag-4 to Mag 6.

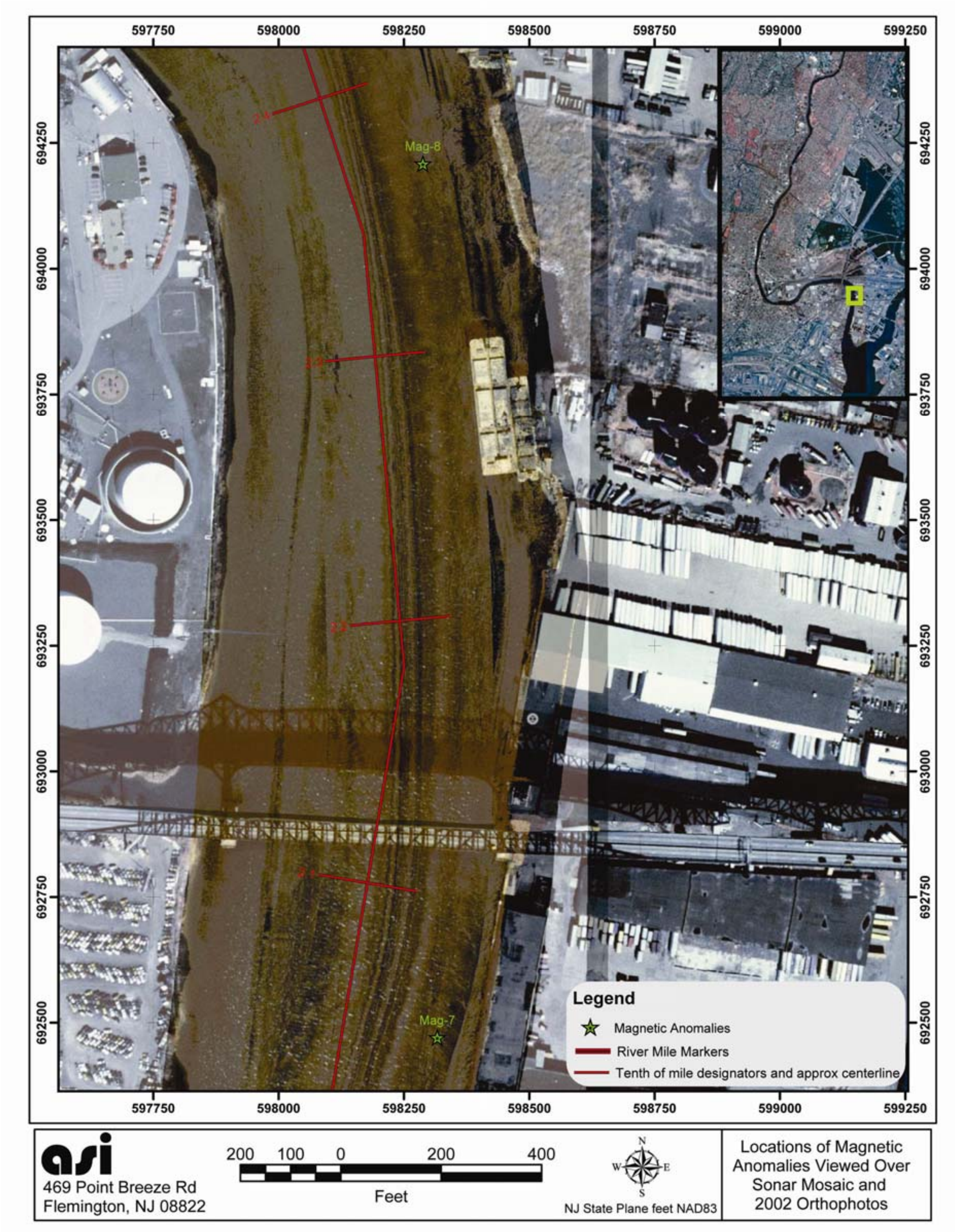

Figure 5. Locations of magnetic anomalies Mag-7 and Mag-8.

R2-0007280

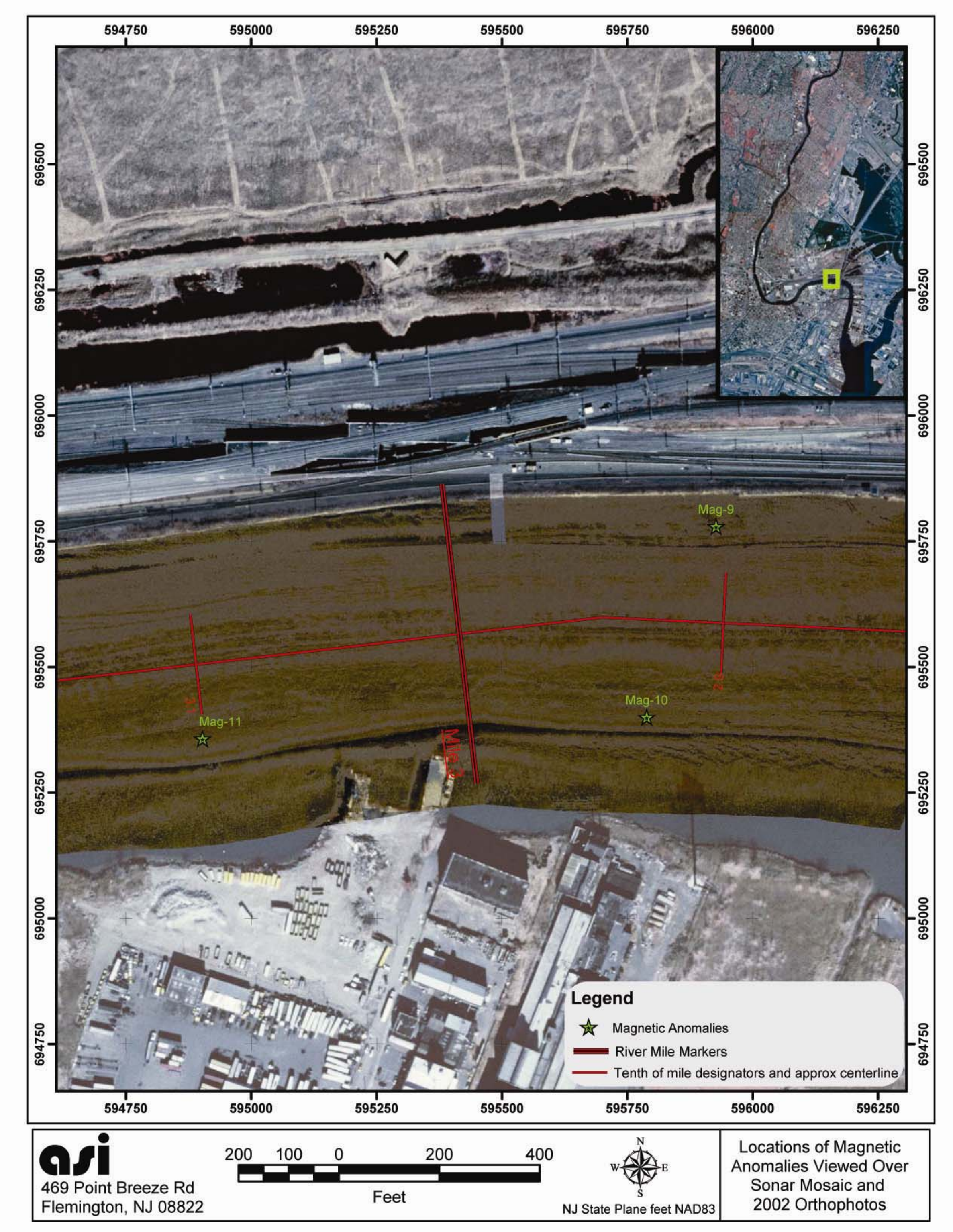

Figure 6. Locations of magnetic anomalies Mag-9 to Mag-11.

Figure 7. Locations of magnetic anomalies Mag-11 to Mag-14.

R2-0007282

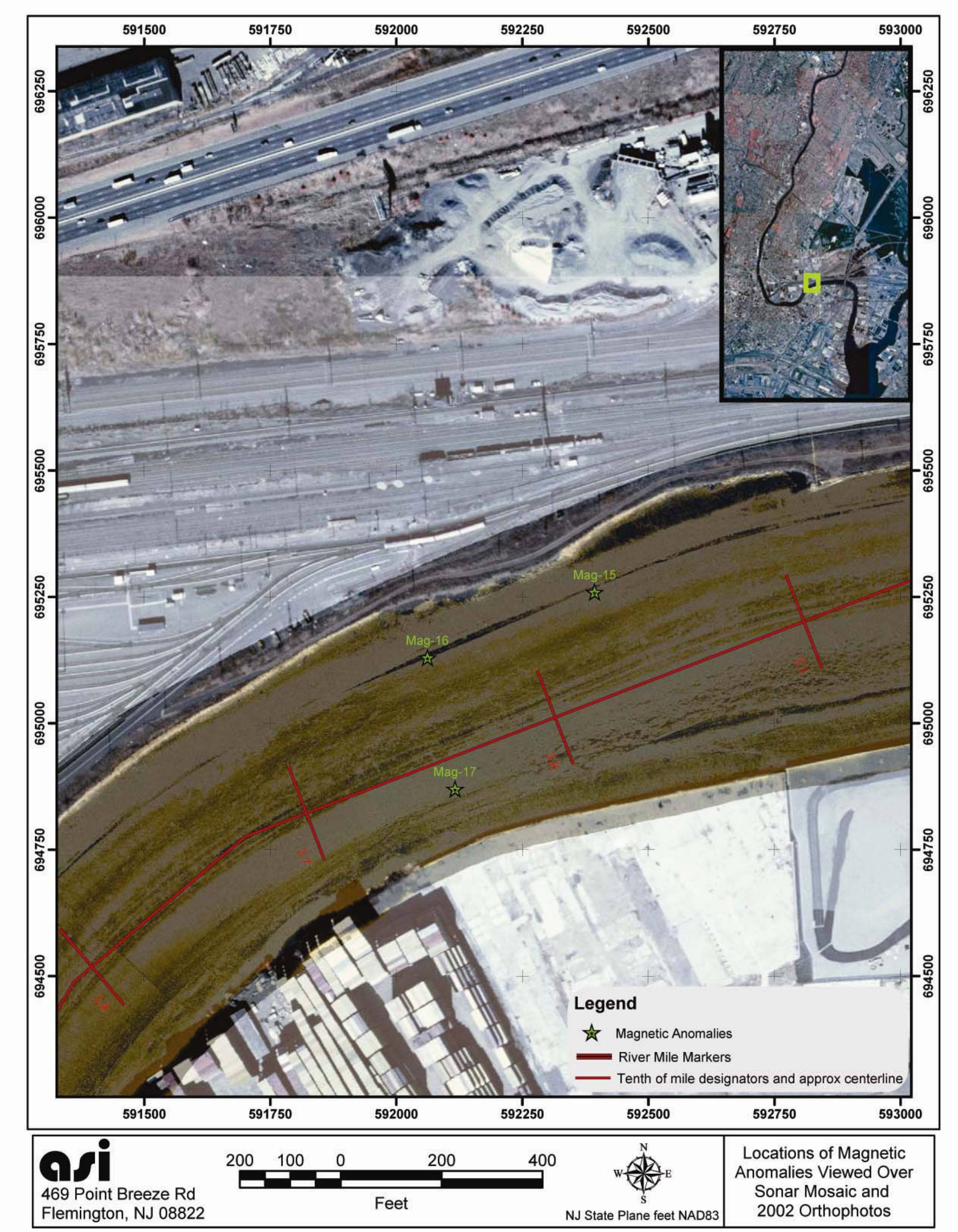

Figure 8. Locations of magnetic anomalies Mag-15 to Mag-17.

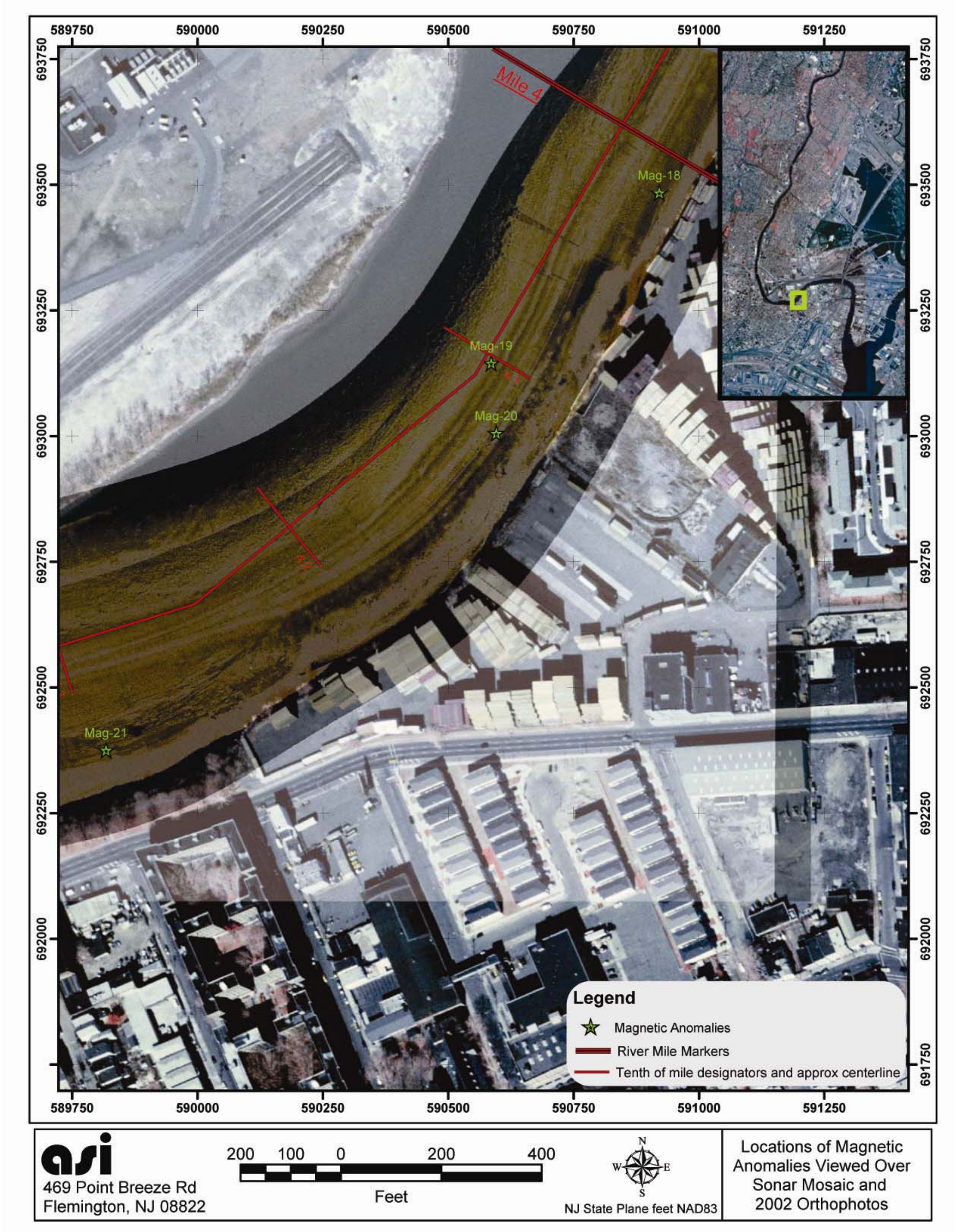

Figure 9. Locations of magnetic anomalies Mag-18 to Mag-21.

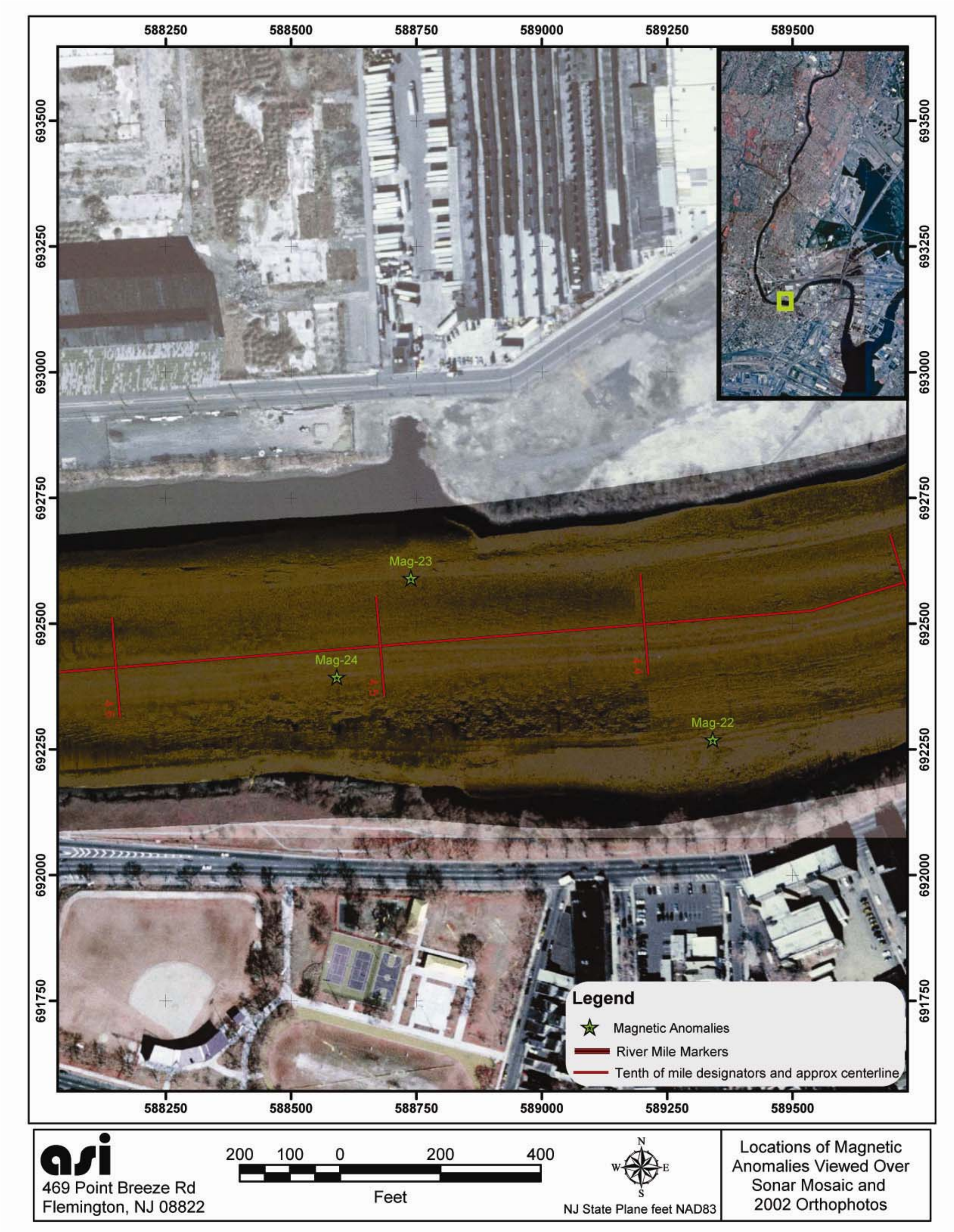

Figure 10. Locations of magnetic anomalies Mag-22 to Mag-24.

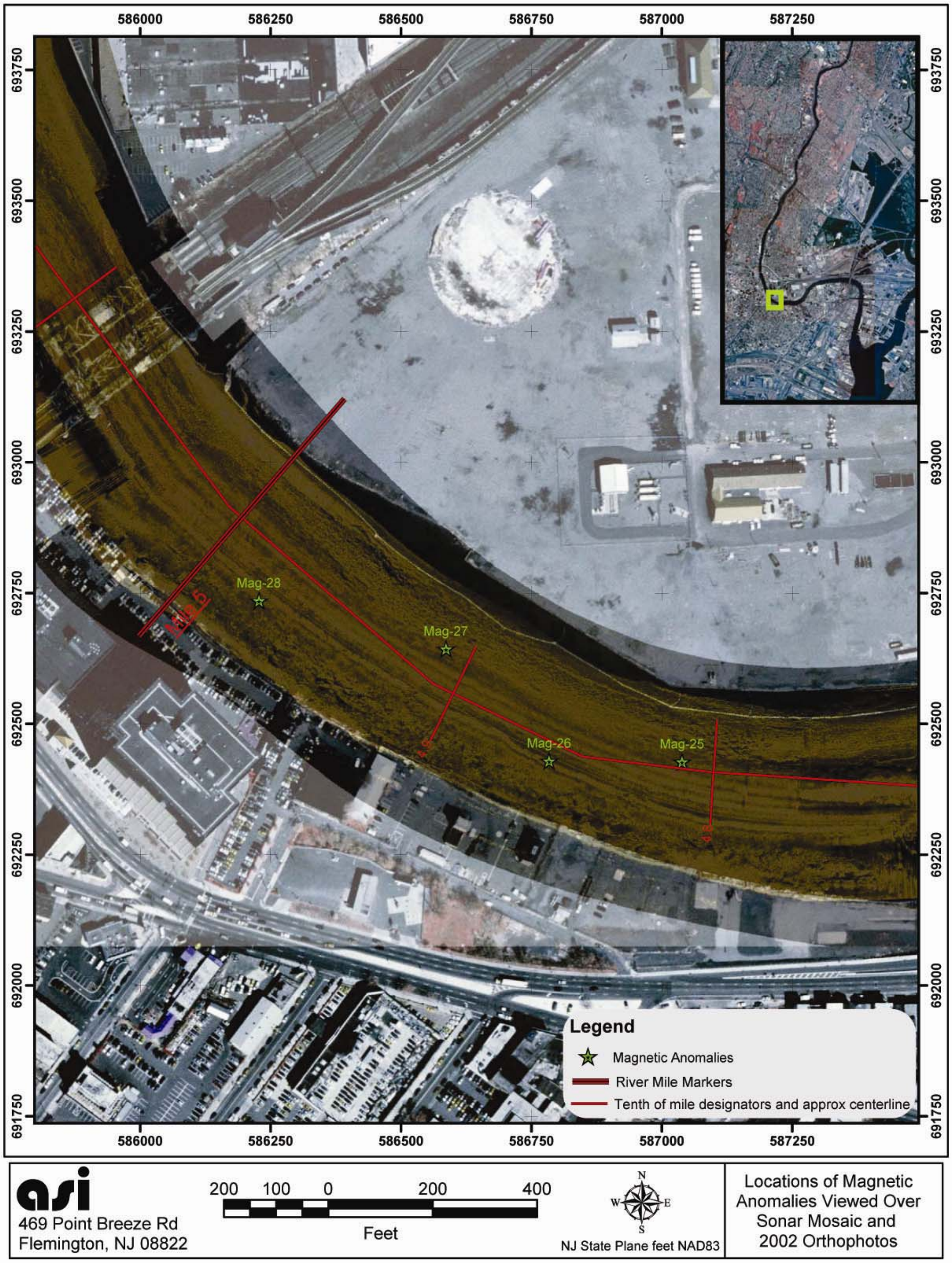

Figure 11. Locations of magnetic anomalies Mag-25 to Mag-28.

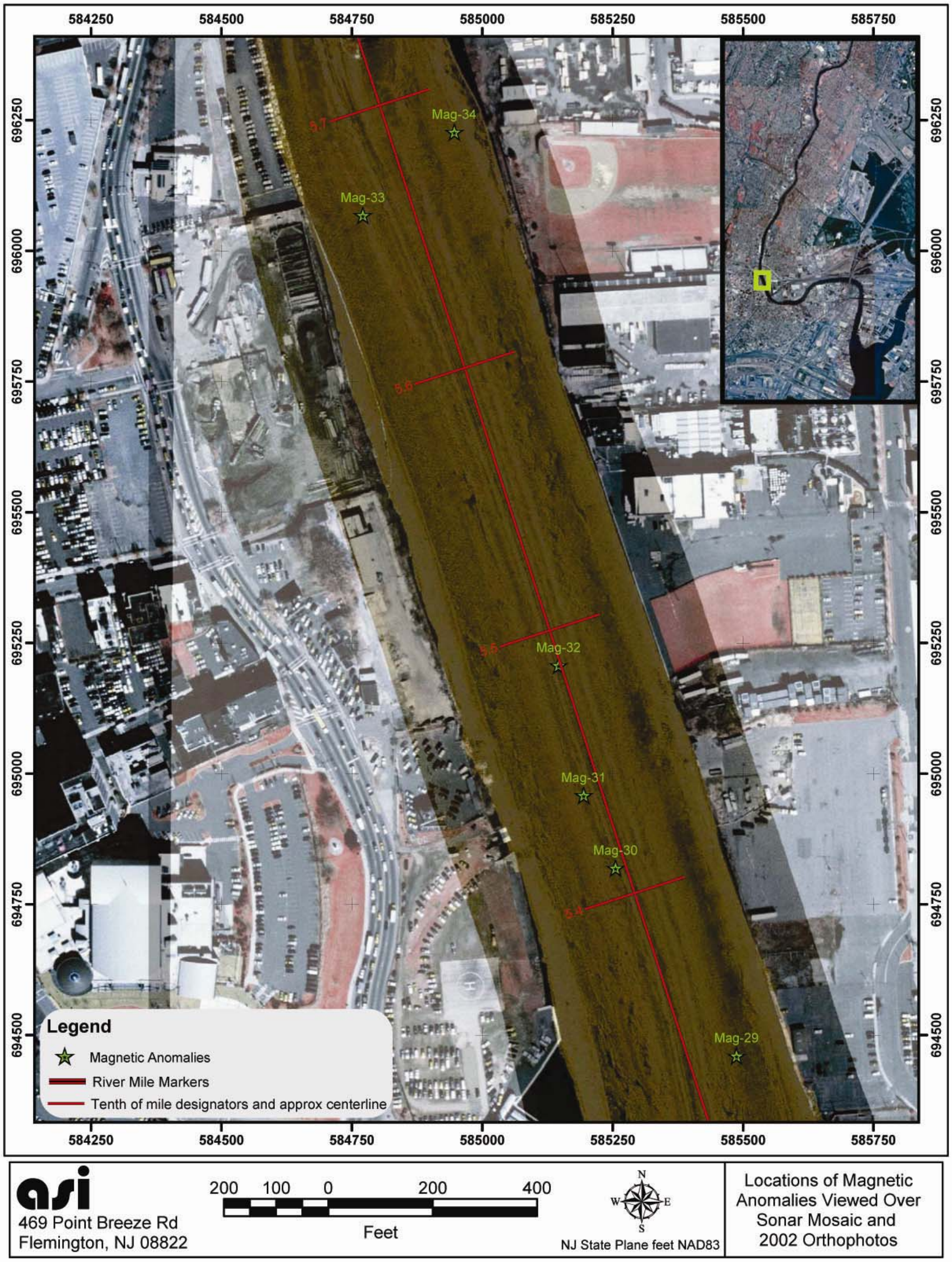

Figure 12. Locations of magnetic anomalies Mag-29 to Mag-34.

R2-0007287

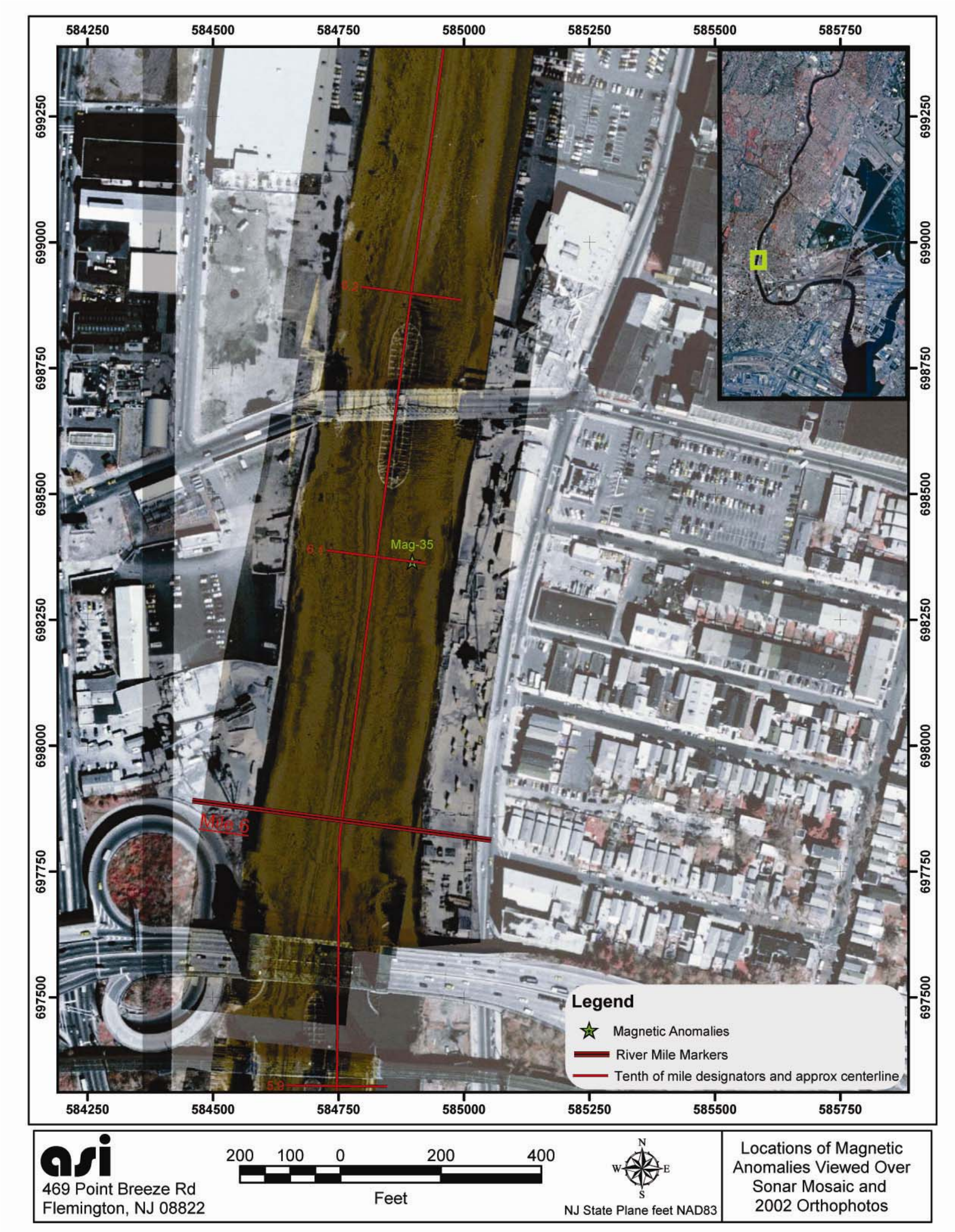

Figure 13. Location of magnetic anomaly Mag-35.

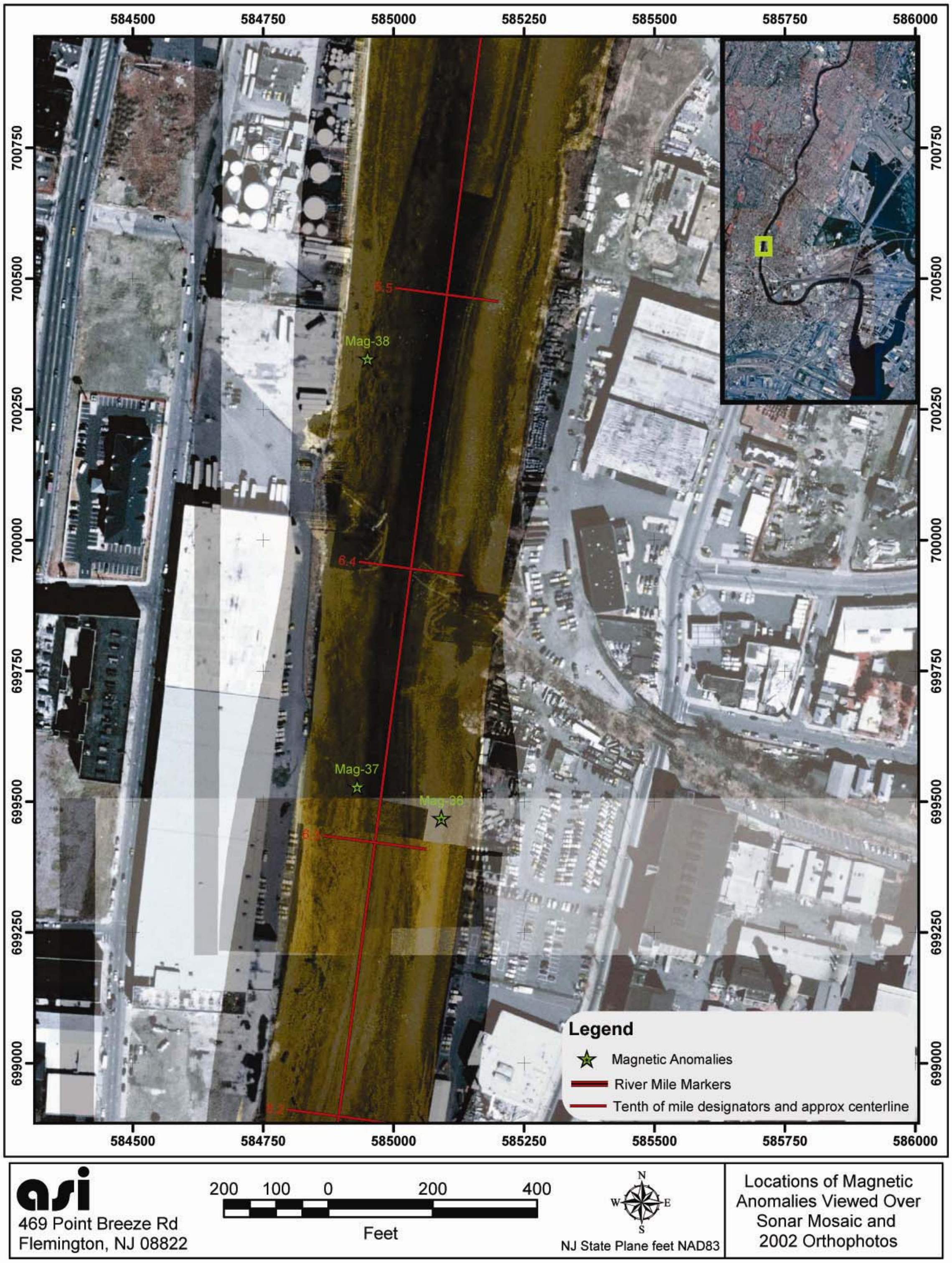

Figure 14. Locations of magnetic anomalies Mag-36 to Mag-38.

Figure 15. Locations of magnetic anomalies Mag-39 to Mag-40.

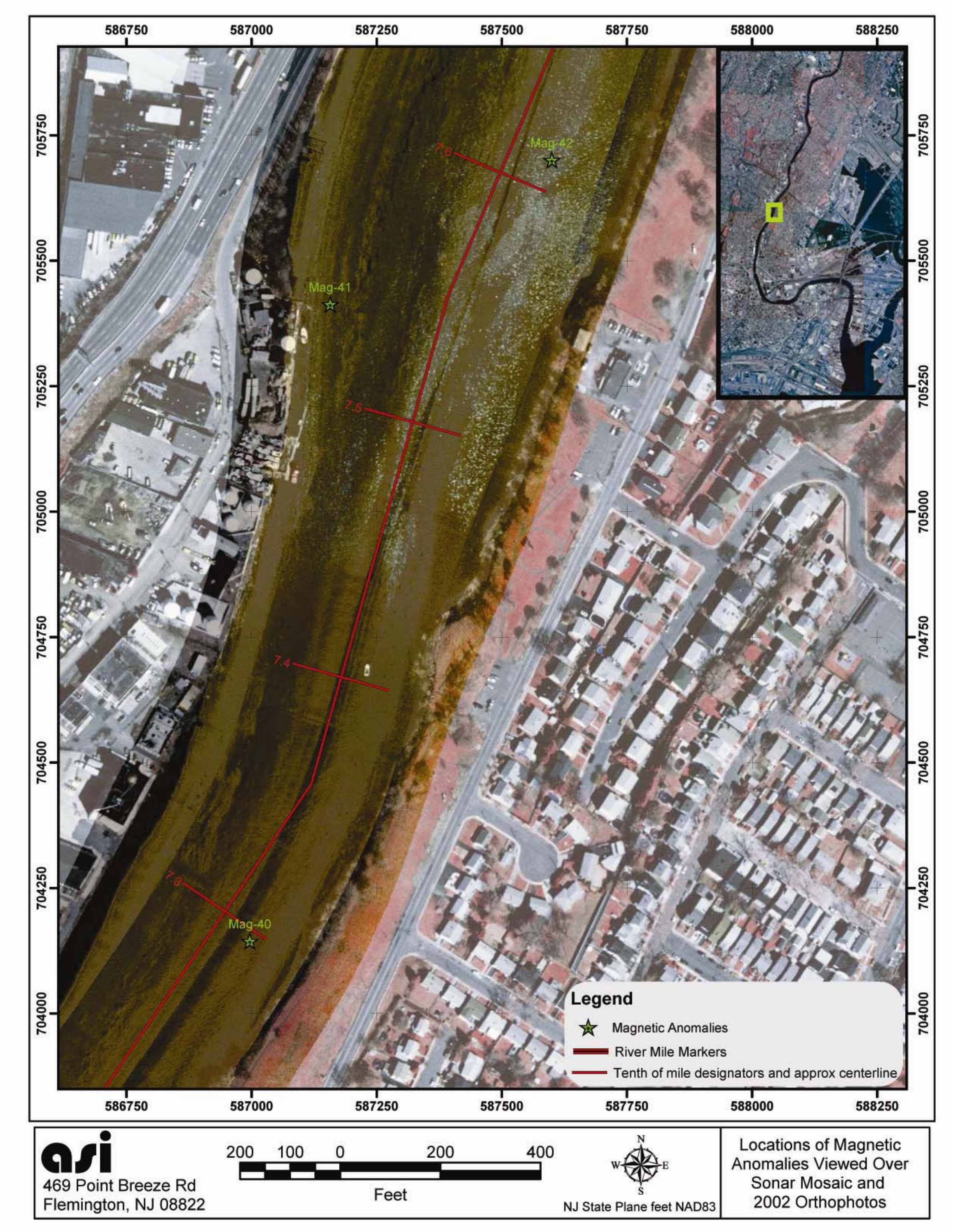

Figure 16. Locations of magnetic anomalies Mag-40 to Mag-42.

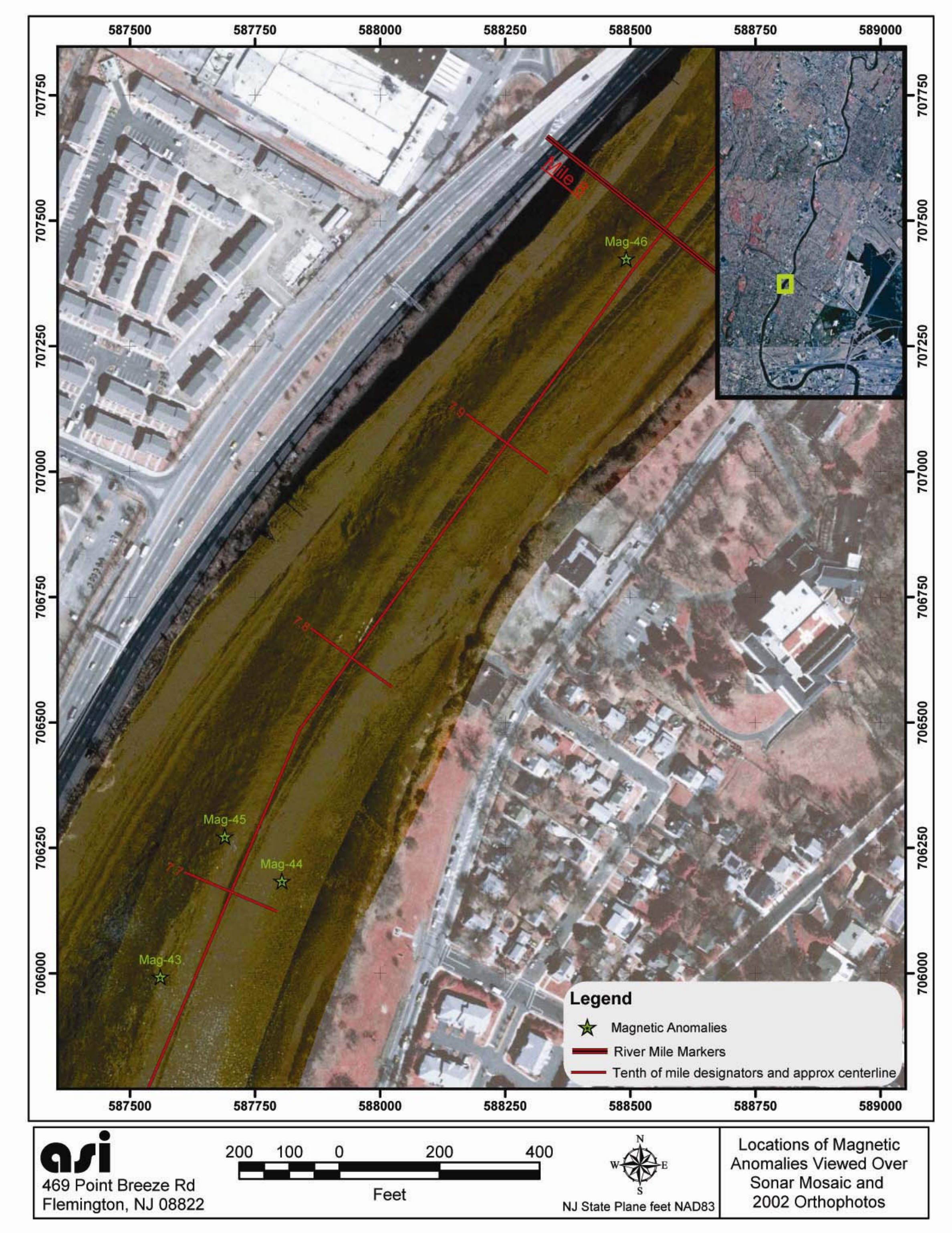

Figure 17. Locations of magnetic anomalies Mag-43 to Mag-46.

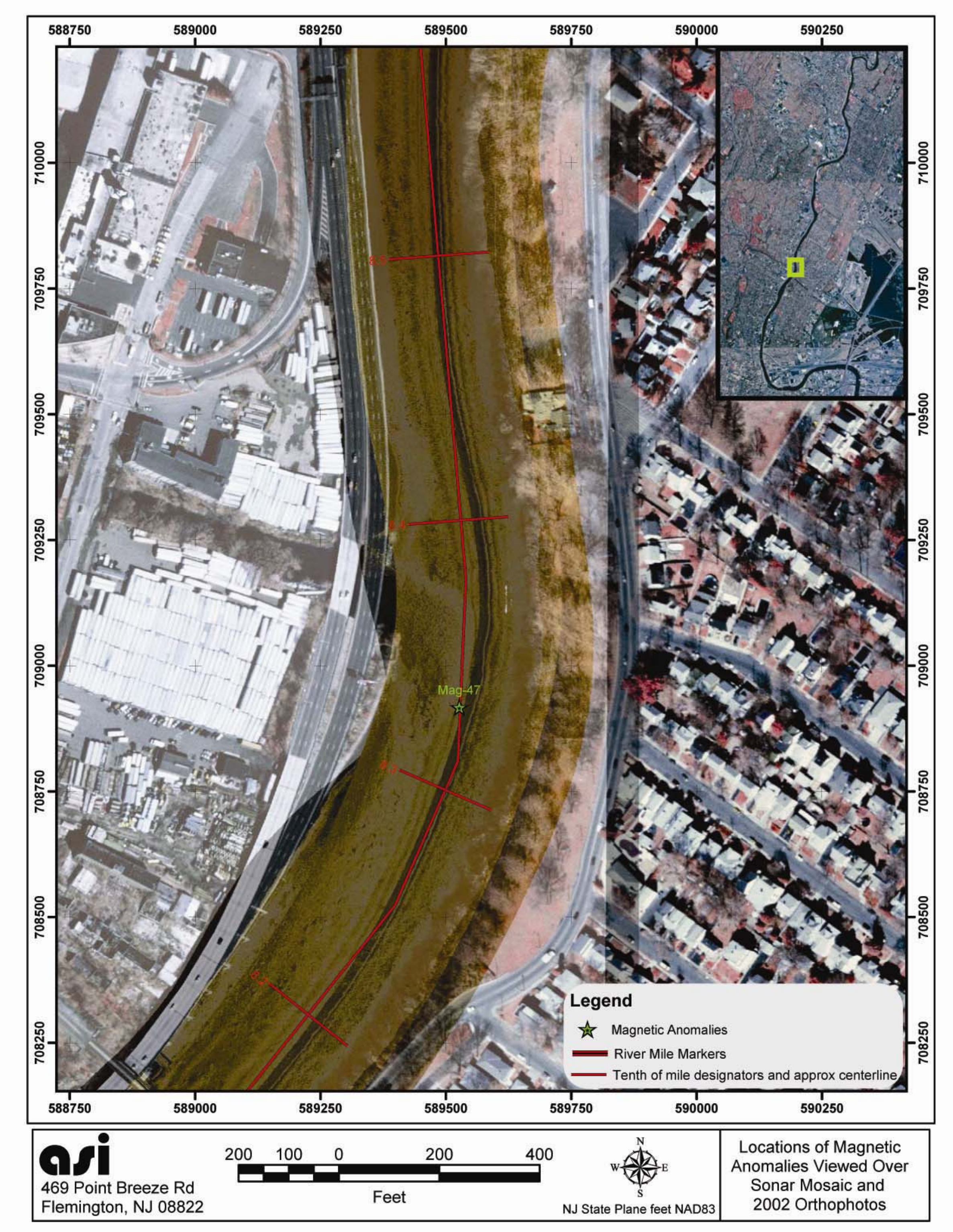

Figure 18. Location of magnetic anomaly Mag-47.

R2-0007293

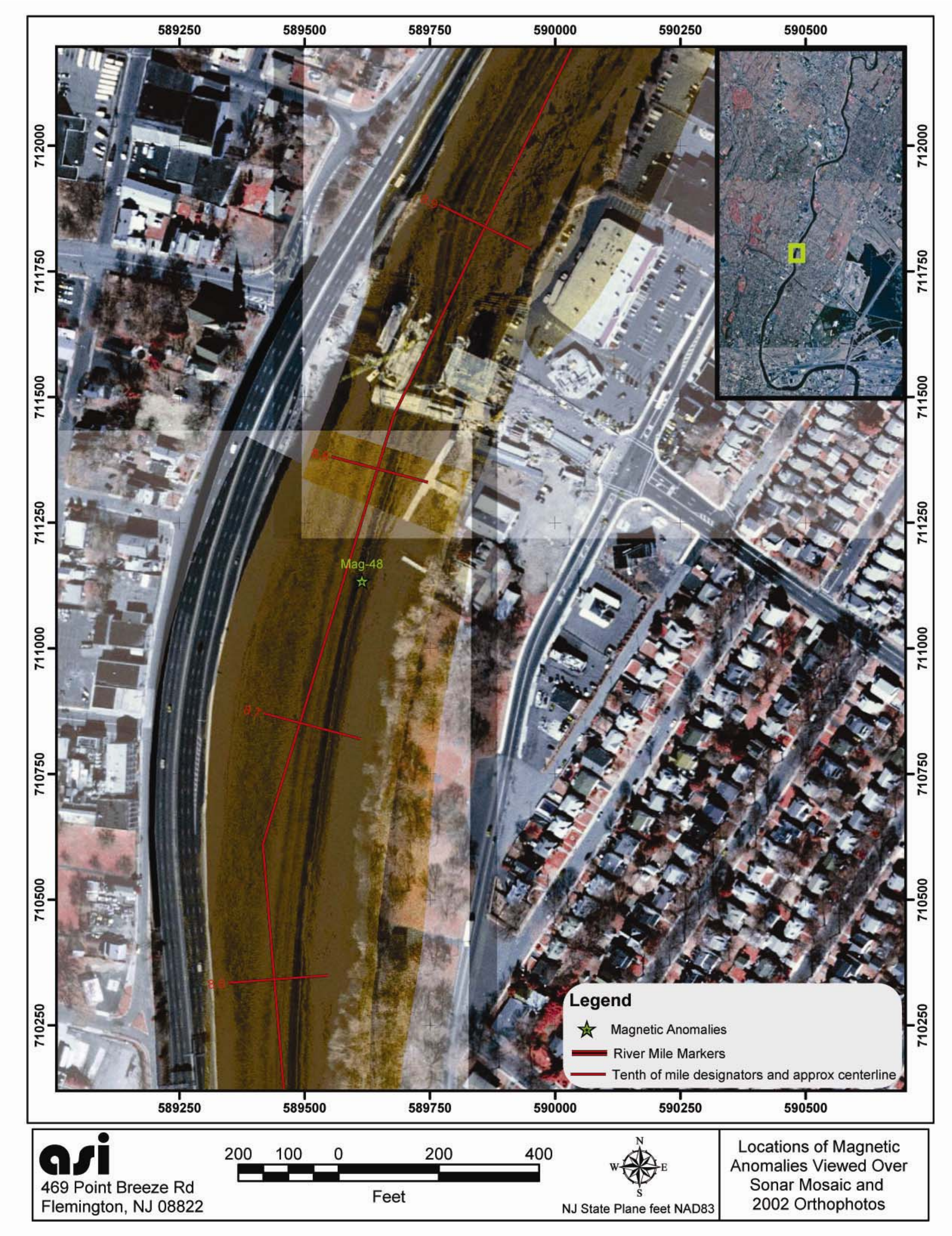

Figure 19. Location of magnetic anomaly Mag-48.

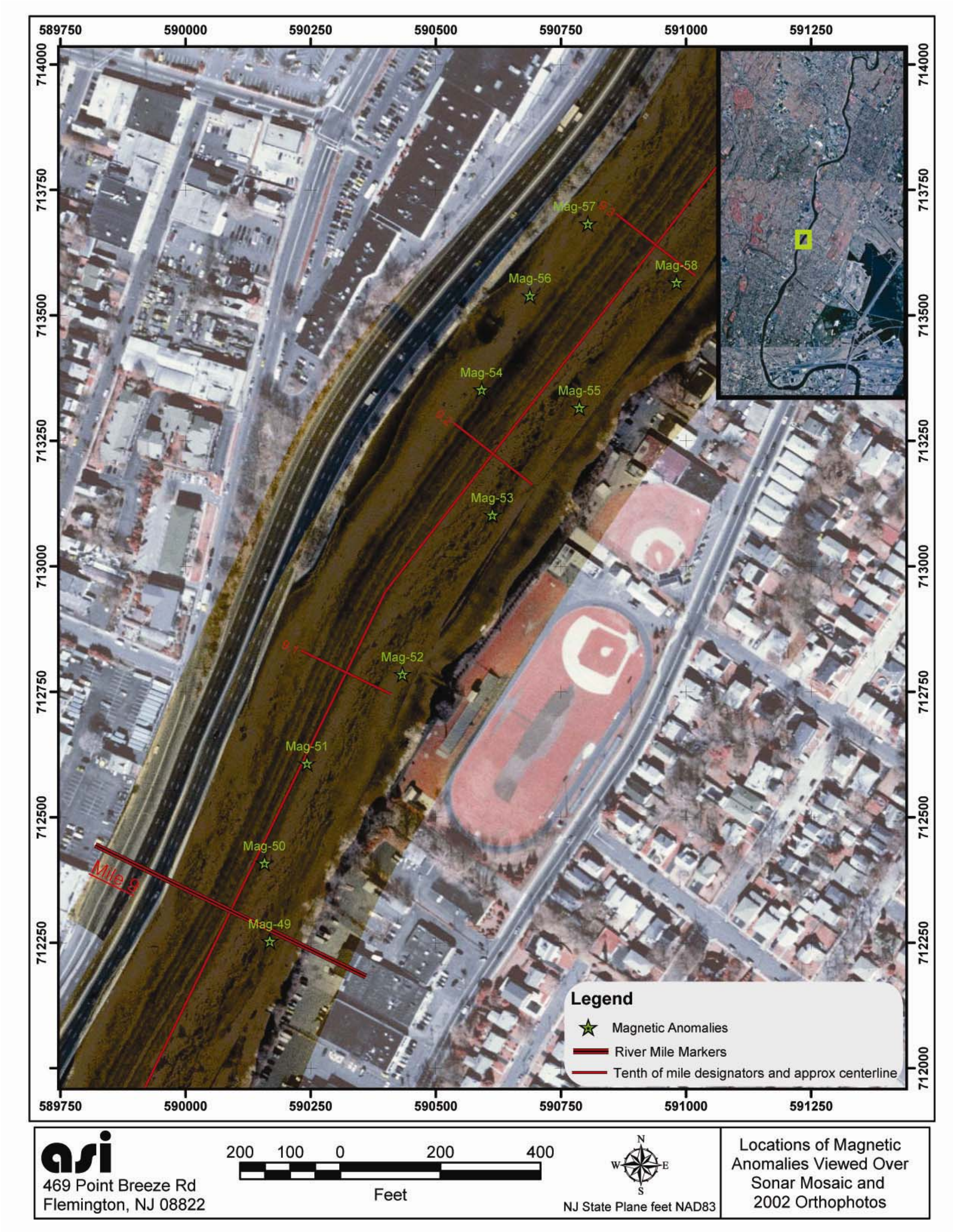

Figure 20. Locations of magnetic anomalies Mag-49 to Mag-58.

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Figure 21. Locations of magnetic anomalies Mag-55 to Mag-66.

Figure 22. Locations of magnetic anomalies Mag-67 to Mag-73.

Figure 23. Locations of magnetic anomalies Mag-74 to Mag-77.

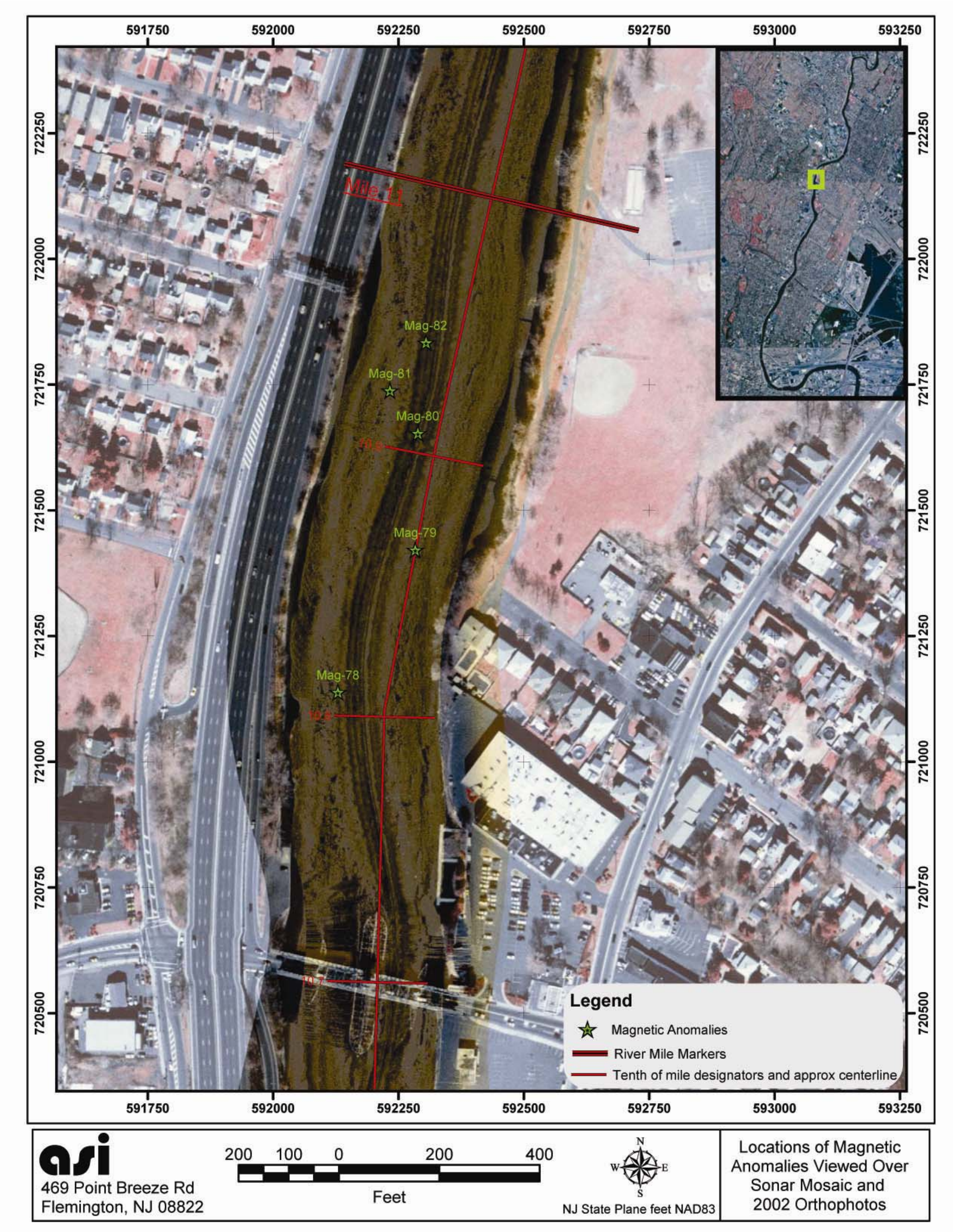


Figure 24. Locations of magnetic anomalies Mag-78 to Mag-82.

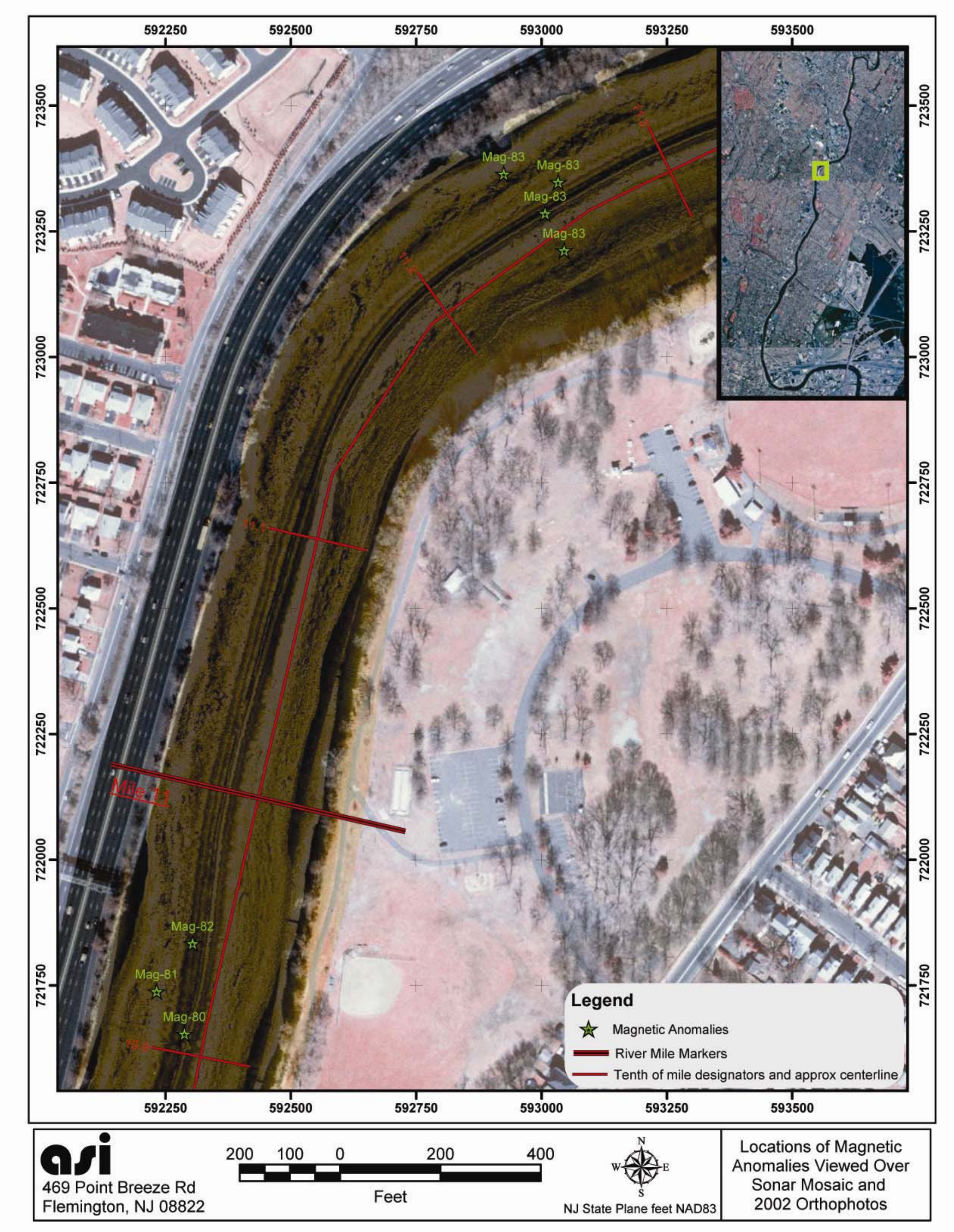


Figure 25. Locations of magnetic anomalies Mag-80 to Mag-83.

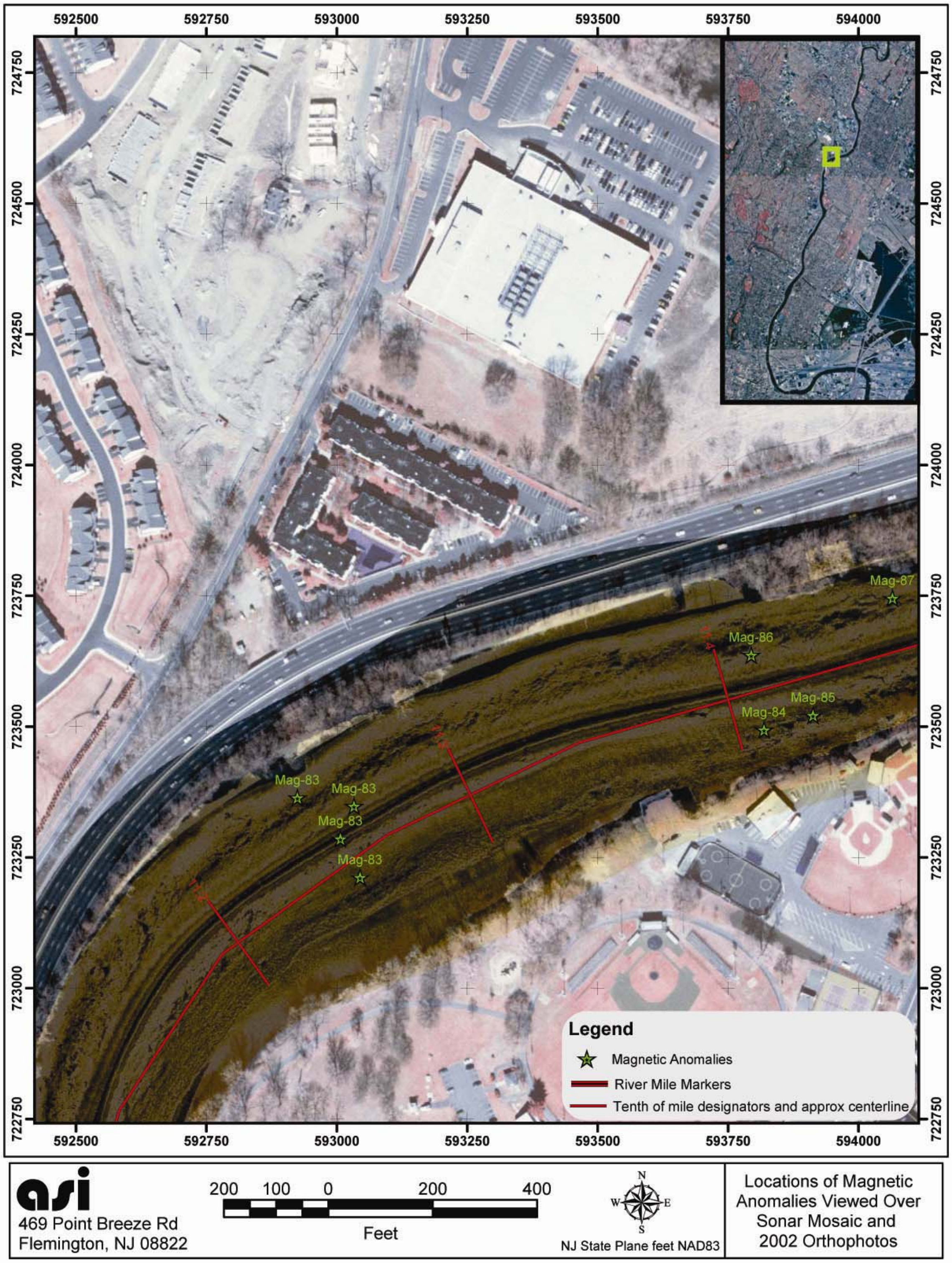


Figure 26. Locations of magnetic anomalies Mag-83 to Mag-87.

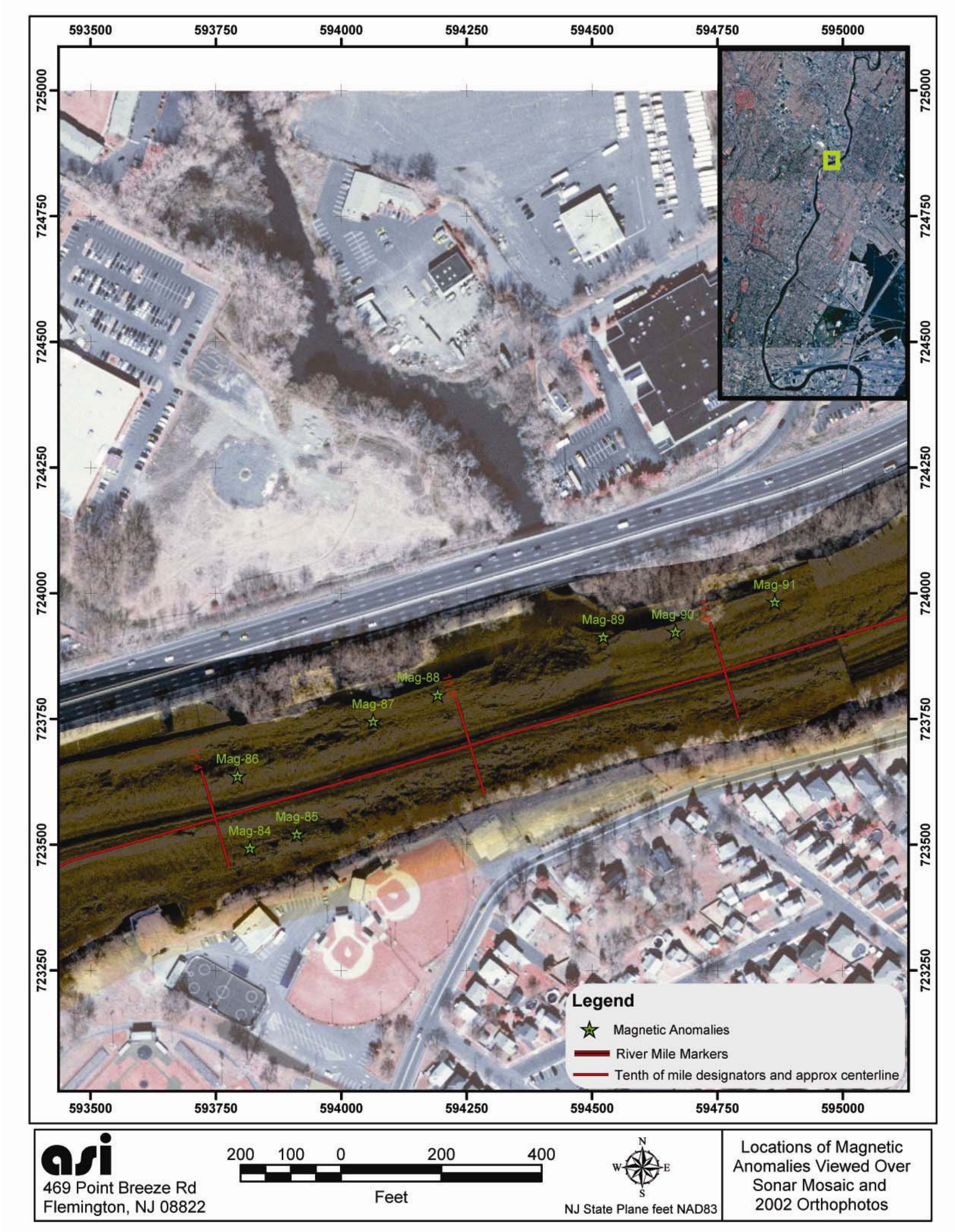


Figure 27. Locations of magnetic anomalies Mag-84 to Mag-91.

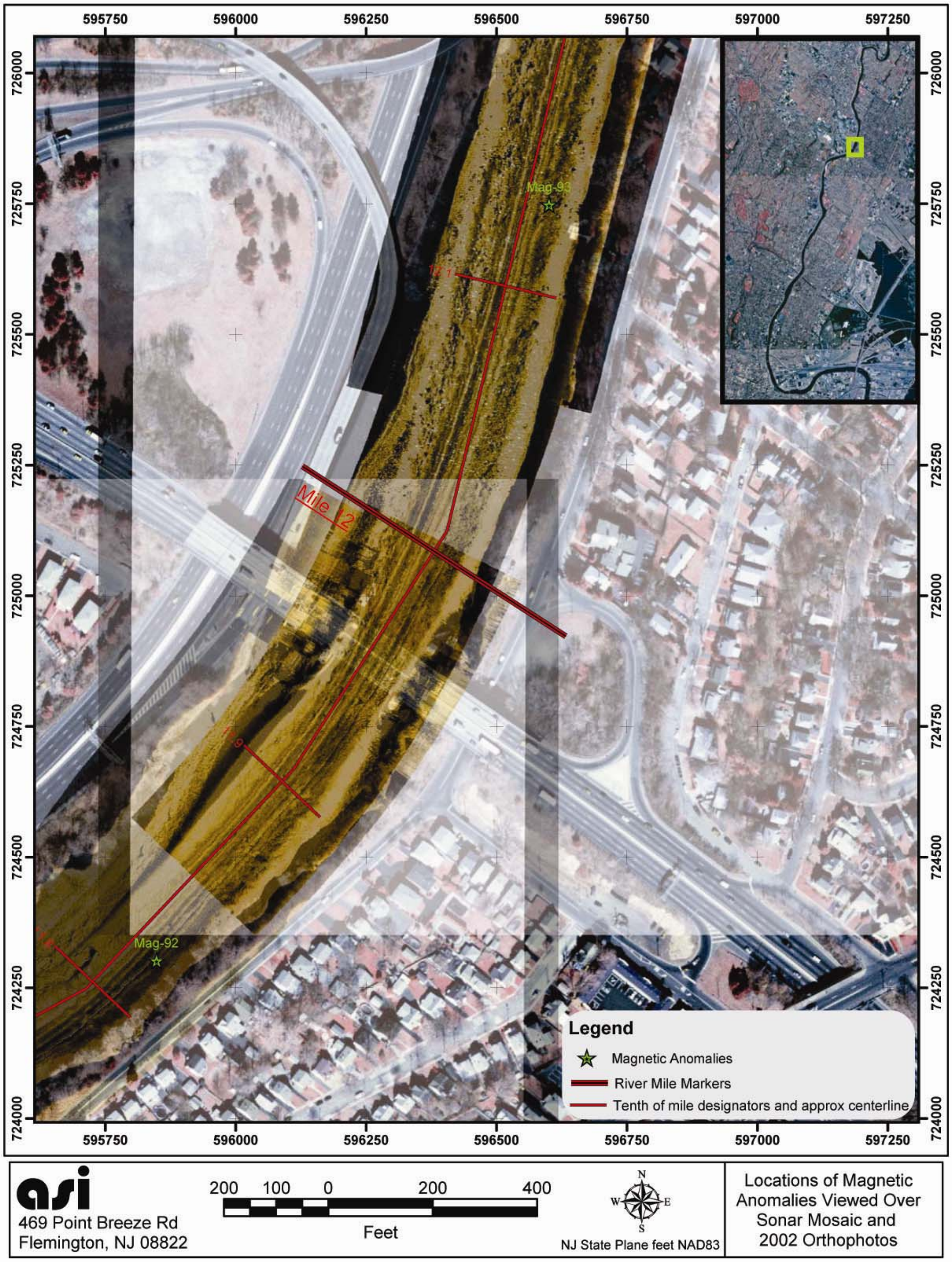


Figure 28. Locations of magnetic anomalies Mag-92 and Mag-93.

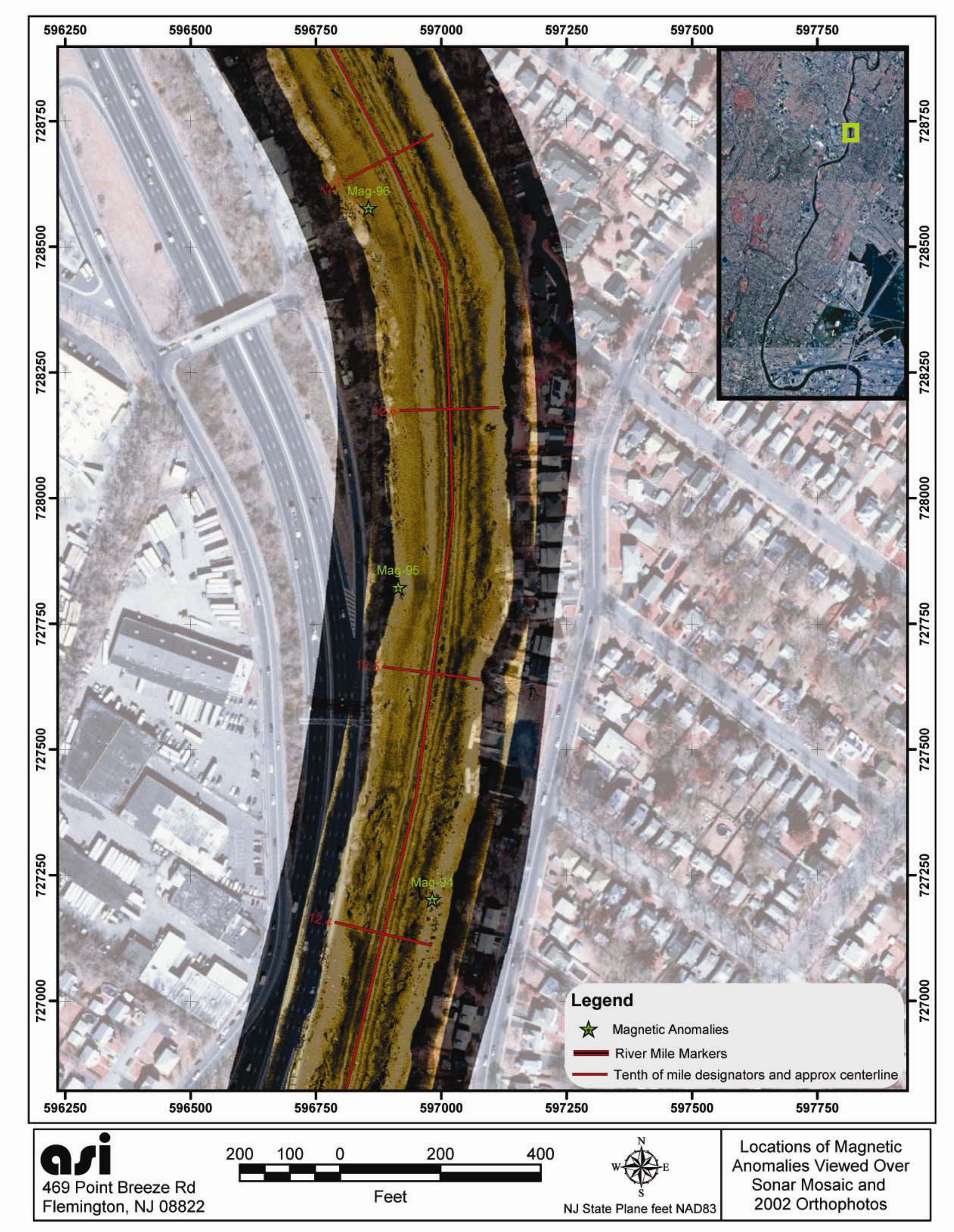


Figure 29. Locations of magnetic anomalies Mag-94 to Mag-96.

Figure 30. Locations of magnetic anomalies Mag-96 to Mag-101.

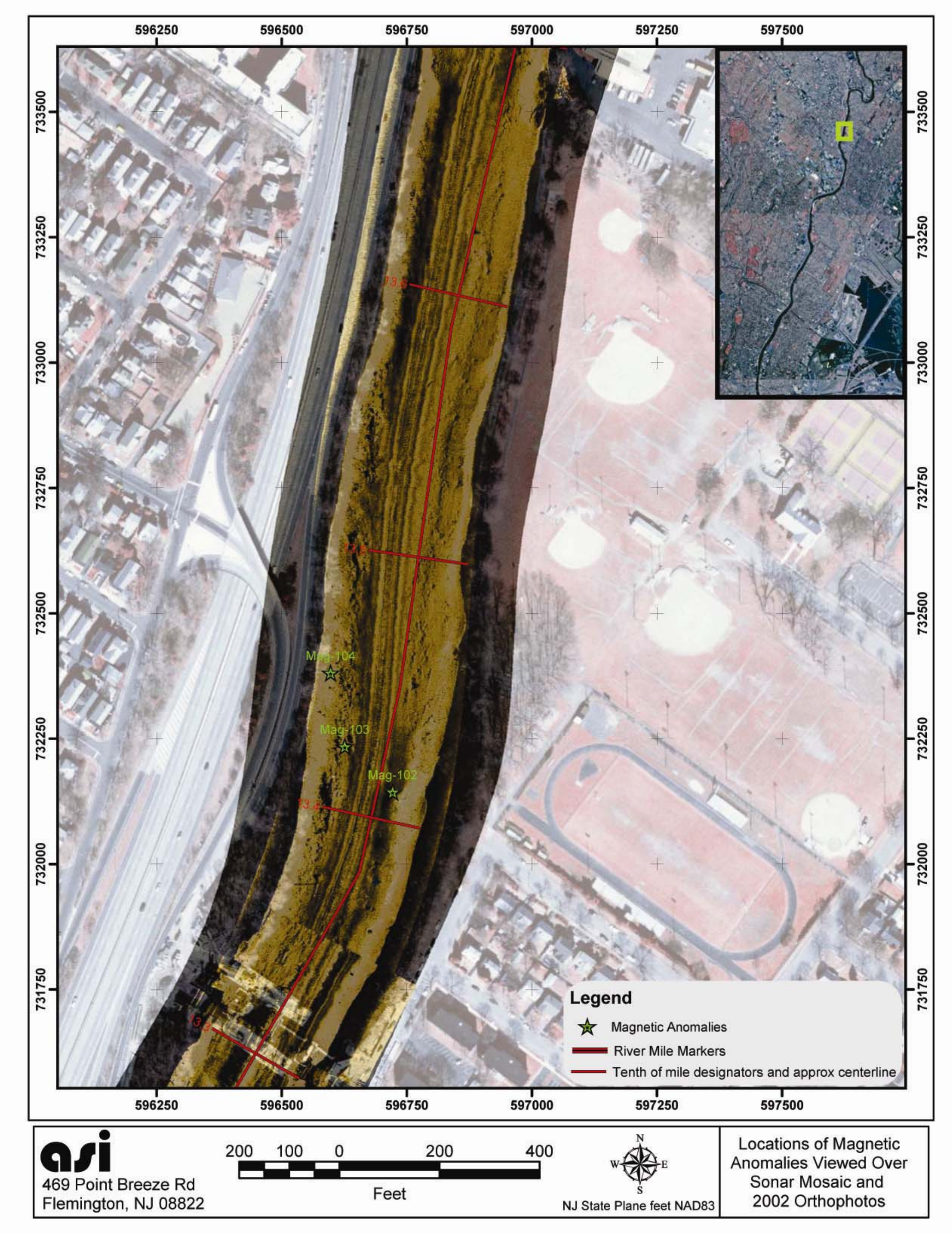


Figure 31. Locations of magnetic anomalies Mag-102 to Mag-104.

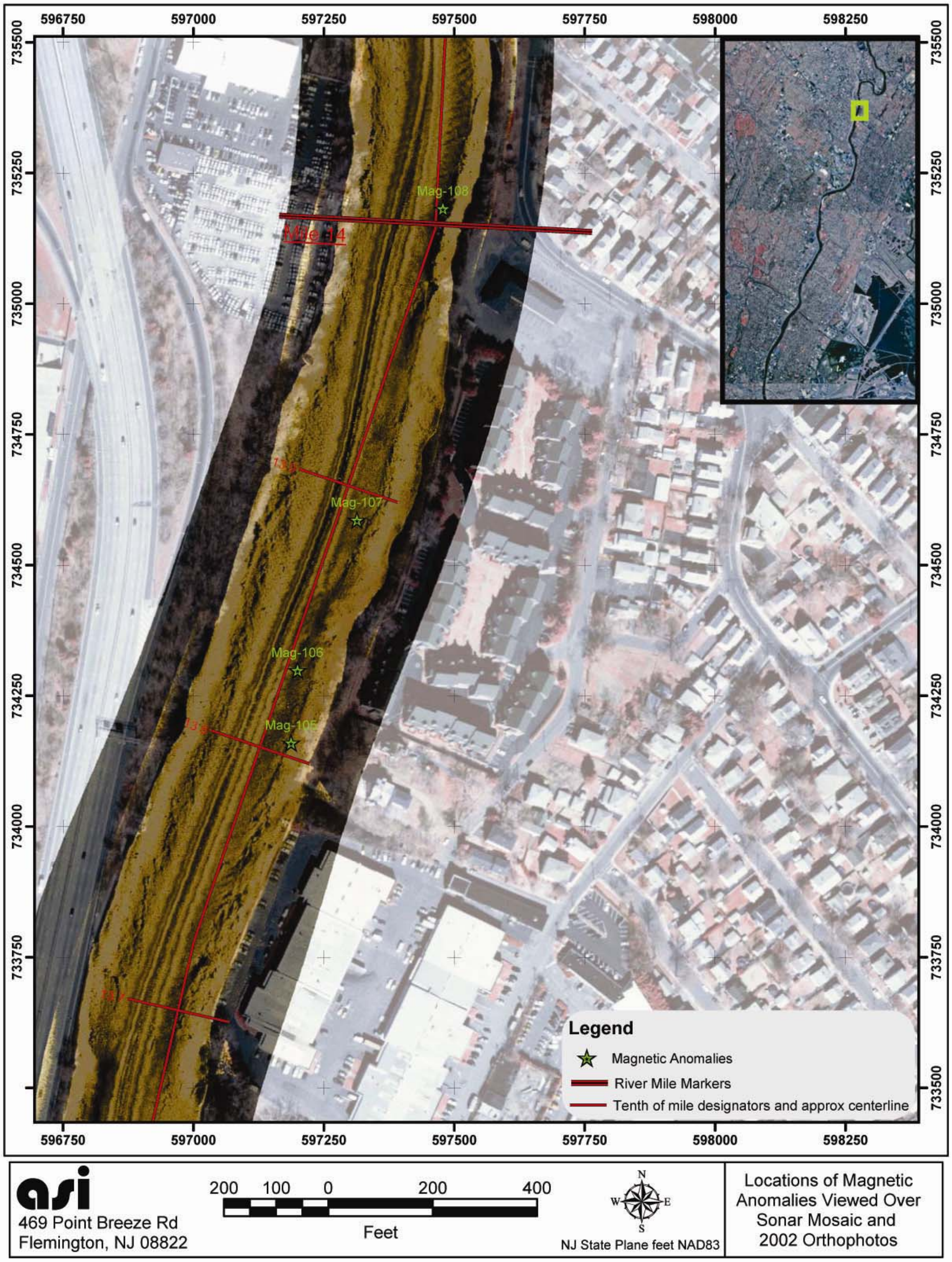


Figure 32. Locations of magnetic anomalies Mag-105 to Mag-108.

Figure 33. Locations of magnetic anomalies Mag-108 to Mag-113.

Figure 34. Locations of magnetic anomalies Mag-113 to Mag-117.

R2-0007309

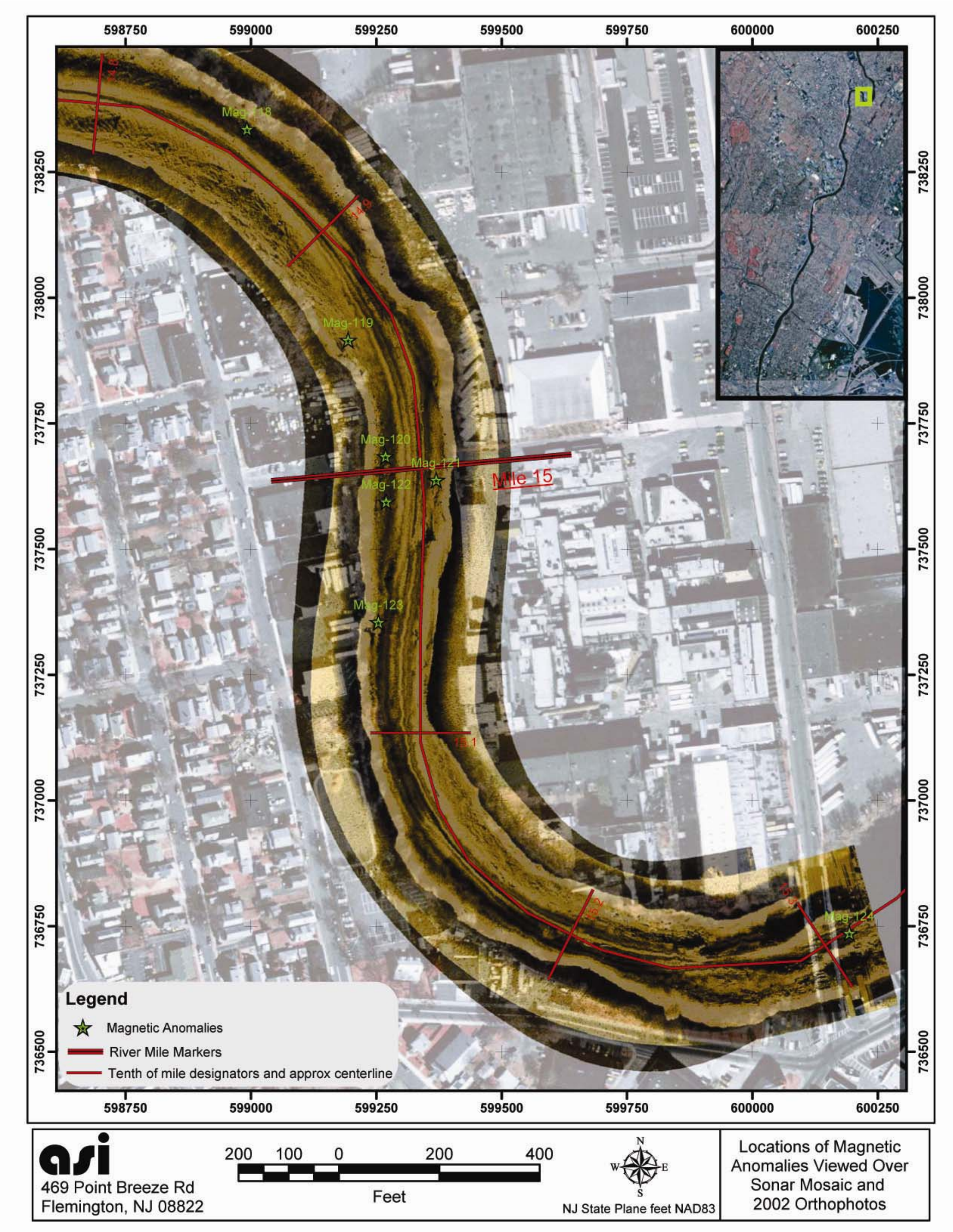


Figure 35. Locations of magnetic anomalies Mag-118 to Mag-124.

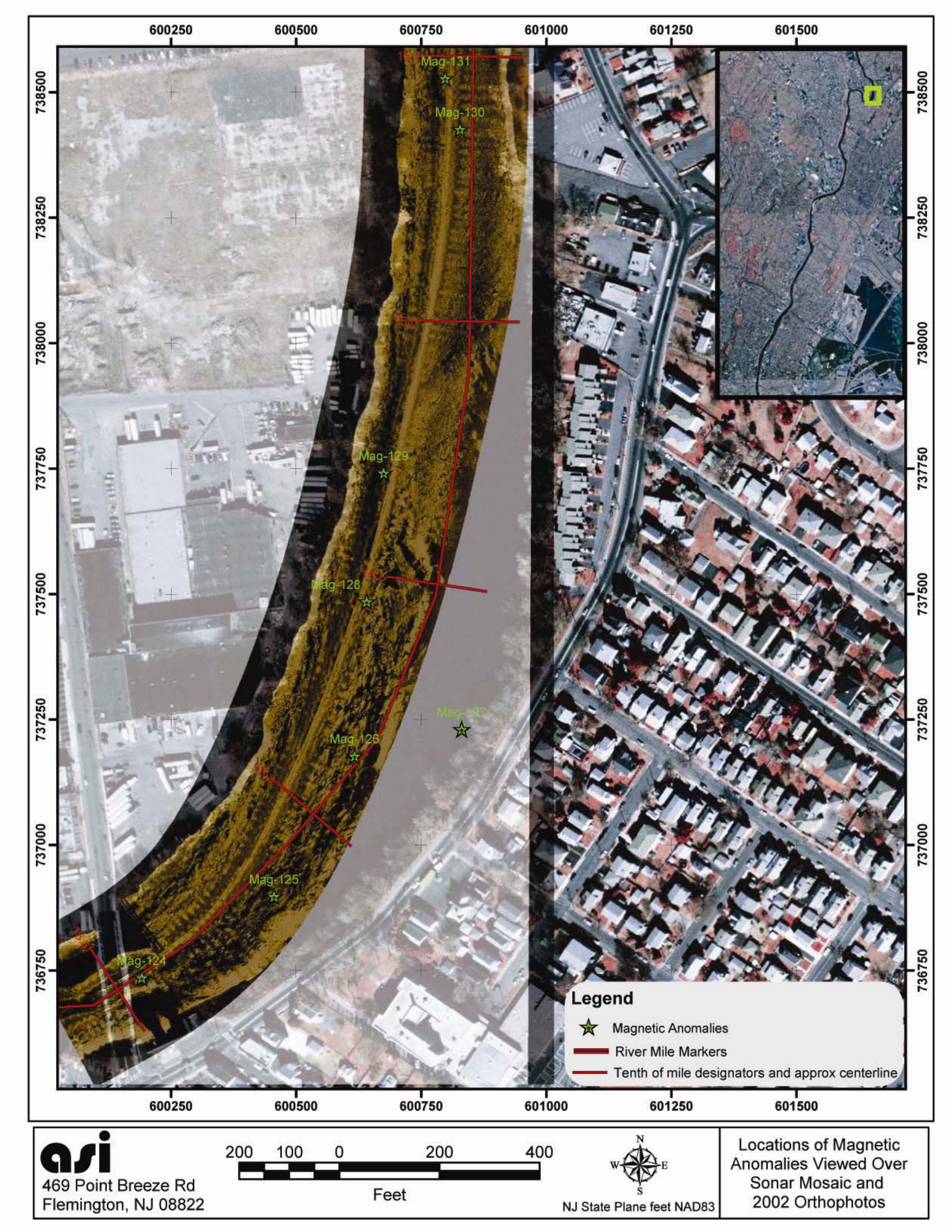


Figure 36. Locations of magnetic anomalies Mag-124 to Mag-131.

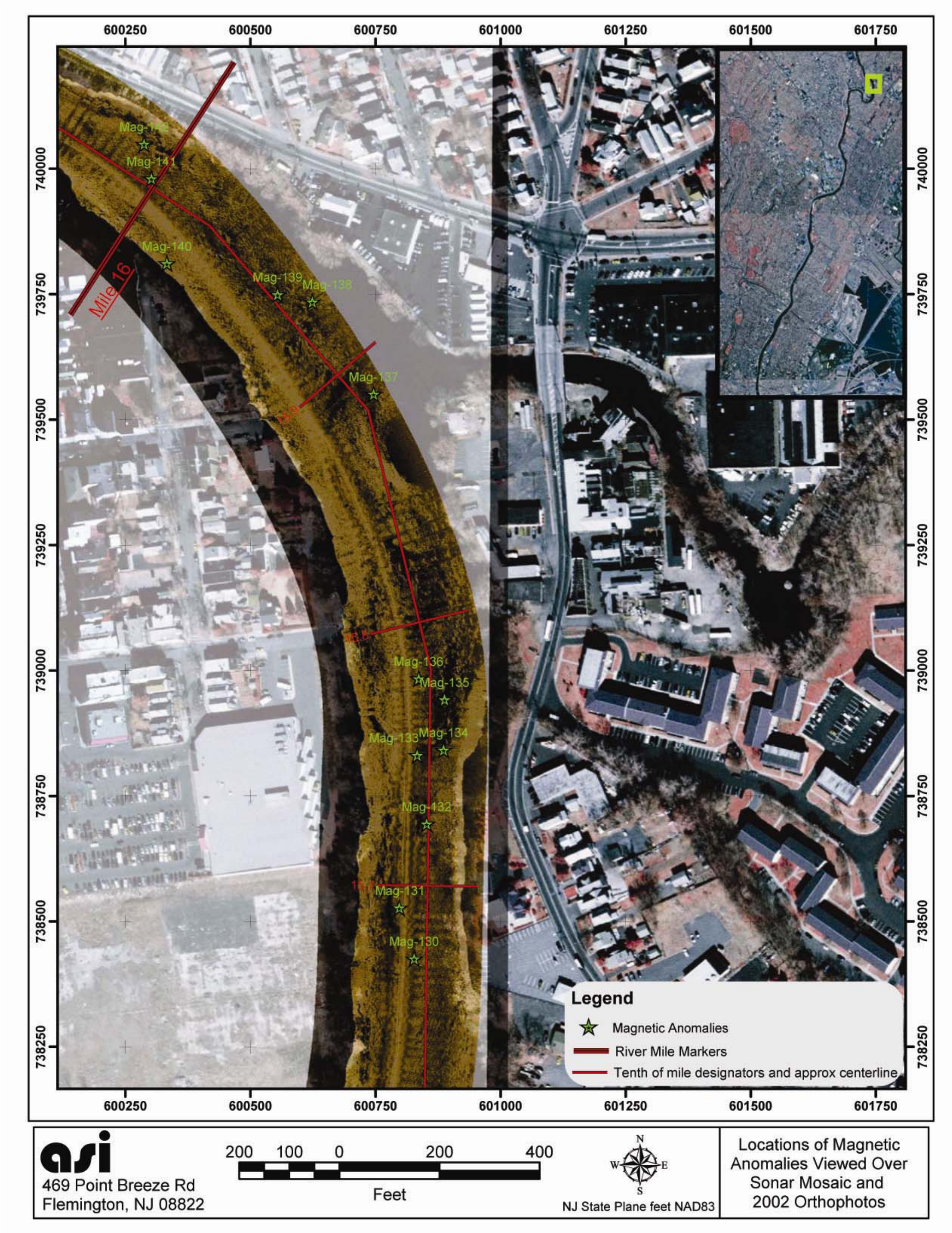


Figure 37. Locations of magnetic anomalies Mag-130 to Mag-142.

R2-0007312

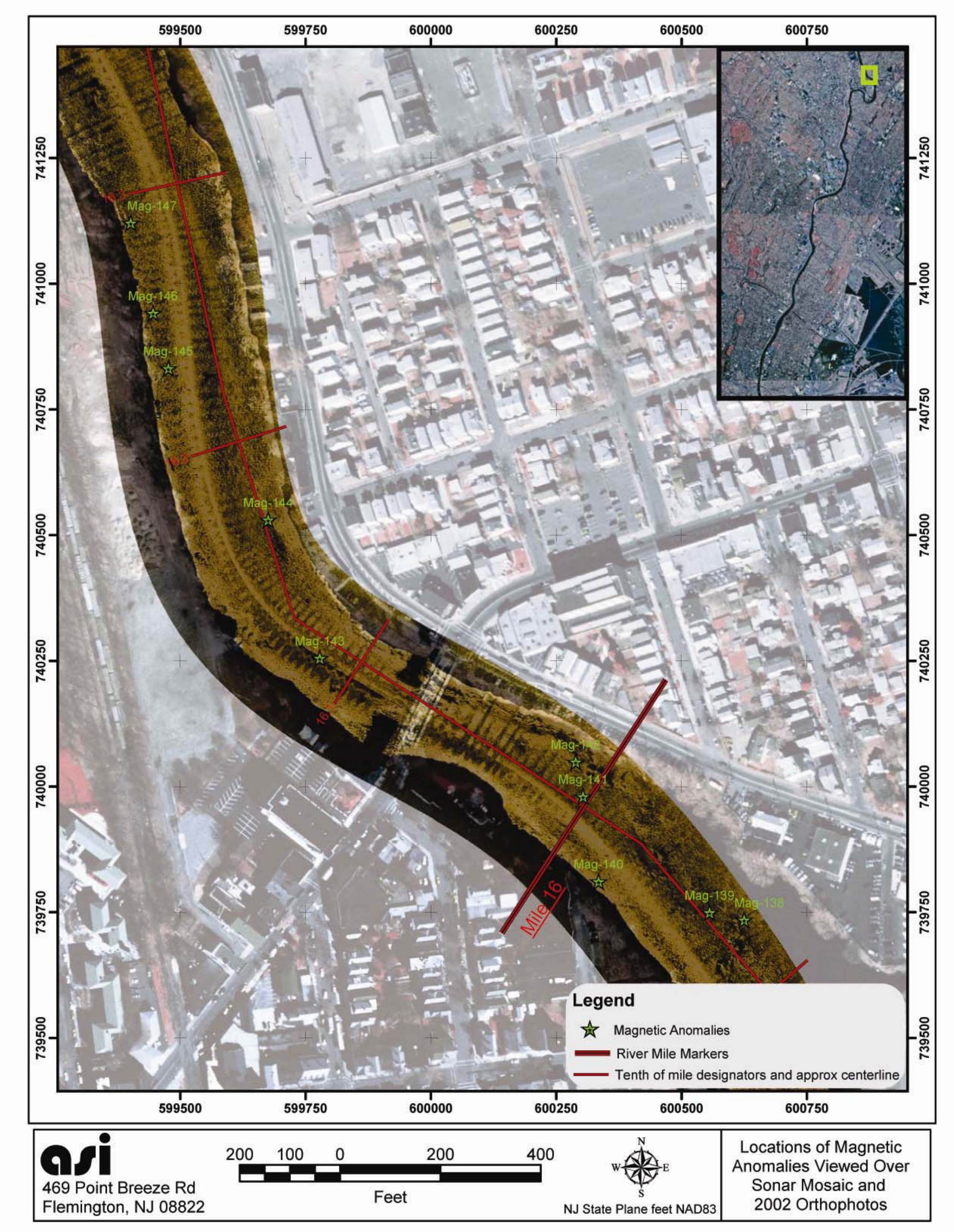


Figure 38. Locations of magnetic anomalies Mag-138 to Mag-147.

D. Side scan Sonar Ground Truthing

Shallow sediment cores were taken and analyzed to help ground-truth the images in the side scan sonar records as well as to help identify the classification results from the Quester Tangent seabed classification software. Five shallow cores were taken approximately every half mile along the length of the project area resulting in 170 cores. Following analysis of the side scan sonar records, an additional 105 locations were chosen to ground truth the side scan results based on differential sediment appearances in those records. These shallow cores were primarily collected by pushing a 1.5 inch diameter hollow tube into the sediment. A check valve attached to the tube allowed for the collection of samples without the use of a nose cone or core catcher which could have potentially disturbed the sample. In areas where the bottom material did not allow collection with the push coring device, a ponar grab sampler was used to collect the sample. Photographs were taken of each sample and the sample was field logged and visually classified. The photographs are included in the associated GIS. One hundred of the samples were retained and sent to an EPA laboratory (DESA) for grain size and total organic carbon analysis. The field logs and DESA lab results are included in Appendix B. The results from Quester Tangent were compared with the sonar mosaics and the results of the shallow core ground truthing to produce a simplified surficial seabed classification map of the project area. Charts were made comparing the surficial seabed classification map, field classification, and DESA results in order to statistically determine how similar the results compare between the different analytical sources to gain confidence in the results. These charts are included in Appendix C.

E. Sub-Bottom Profiler Ground Truthing

Deep sediment cores were taken and analyzed to help ground-truth the sub-bottom profiler results and help characterize the subsurface geology. Three vibracores were taken at 17 of the 51 sub-bottom profiler transects that were chosen along the length of the river. Transect spacing was approximately every mile, though the actual location of each transect was chosen based on the sub-bottom reflectors detected during the remote sensing survey.

Rossfelder P-3, P-4, and VT-6 vibracorers were used in order to get penetrations up to 33 feet below the riverbed. Initial attempts to vibracore without a core catcher resulted in no recovery, so it was decided to use the catchers for the deep coring program. A 4-inch diameter steel barrel was used in conjunction with soft liner to facilitate sample analysis and inspection. All cores were logged and field classified by geologists from Malcolm Pirnie. Approximately 50 sediment samples were chosen and analyzed by Aqua Survey for grain size, total organic carbon, Atterberg limits, bulk density, moisture content, and percent solids. These results can be found in Appendix D.

F. Side scan Sonar Survey Data Collection and Results

The side scan sonar survey encompassed the entire river bottom within the channel between the confluence with Newark Bay and the removed bridge between Newark and Kearny, and from shoreline to shoreline above that point to about one mile below the Dundee Dam where the river was too shallow for the sonar to effectively operate. This survey was conducted using a Marine Sonic Sea Scan PC sonar system with a single frequency 600-KHz towfish. The RTK-DGPS was used for positioning and Hypack Max survey management software was used for survey control and ship track recording. This survey was conducted by running five lines longitudinally along the river spaced approximately 100-feet apart with one line immediately adjacent to each shoreline. Range was set to 50 meters per side, resulting in greater than 200% coverage (the entire riverbed being insonified at least twice). In areas where the river was narrower, greater than 400% coverage was obtained.

The side scan survey was designed to optimize resolution of the side scan sonar records. Prior to commencing survey operations, the sonar was tuned and adjusted to find the optimal combination of control settings that yielded the best image. Gain settings were adjusted as little as possible, to allow accurate post-processing. Data were logged to the onboard computer for later review.

1. Debris/Obstruction Survey

Side scan sonar records were analyzed in conjunction with the bathymetry data for evidence of objects on the seafloor and geophysical processes and sediment types. Detected features were plotted at their locations on the geo-referenced GIS drawing. Targets marked included all sonar features with significant areal extent and acoustic shadow (indicating projection above the seafloor) and seafloor topographic features that could pose a threat to or serve as an obstruction for future dredging operations, if any. Sonar features were analyzed to determine locations, ranges, shadow lengths, scaled sizes, towfish heights and descriptions.

Forty sonar targets were found that fit the target criteria. Of those, 16 targets with acoustic signatures similar in dimension and appearance to cars were detected (Figures 58 to 69). Basic descriptions and locations for the cars can be found in Table 2. The majority of the car targets are clustered in the river in the vicinity of Newark, NJ (Figures 40 to 45). One car target was found considerably further upriver between the Conrail and Rutherford Ave. (Rt. 3) bridges (Figure 53). Though side scan sonar cannot guarantee that all of these targets are automobiles, further investigation is recommended to determine the nature of the objects detected. Twenty-four other sonar targets were found that could be obstructions or pose a threat to future operations on the river. Basic descriptions and locations for those targets can be found in Table 3. Maps showing their individual locations can be found Figures 39 to 57. The target images from the sonar records can be found in Figures 70 to 91. One sonar target, the remains of a vessel, should be investigated further should future project operations impact the site (Figures 51, 92, and 93).

Car Number	Easting	Northing	General Area/Description
1	590719.1	693114.6	Probable car, 22 feet off bank on west side of gravel pile
2	586740.9	692360.1	Probable car, 25 feet off of west bulkhead, between Jackson St and Dock RR Bridge
3	586013.8	692817.5	33 feet off of bulkhead
4	585975.1	692867.8	50 feet off of west side, 98 feet upriver from car 3
5	585377.5	695026.3	Probable car, 26 feet off of bulkhead
6	584589.2	697069.5	69 feet off of shoreline
7	584721.2	698499	Probable car, 44 feet off of west shore
8	584803.5	699007.2	34 feet off of bulkhead, 145 feet downstream from car 9
9	584821.5	699140.8	33 feet off of bulkhead, 67 feet downstream from car 10
10	584853.5	699201.7	53 feet off of bulkhead
11	584883.7	699778.6	On Western side below out of service bascule bridge, 34' downstream from car 12
12	584874.3	699815	On Western side below out of service bascule bridge, 55' downstream from car 13
13	584887.9	699875.7	On Western side below out of service bascule bridge
14	584936.7	700398.1	Probable car, western side above out of service bascule bridge
15	585500.6	702235.1	Probable Car
16	595978.2	724424.3	55 feet off of eastern shore

Table 2. Locations and descriptions of probable cars.

Name	Easting	Northing	Length (feet)	Width (feet)	Exposed Height (feet)	Description
SSST-1	592245.1	719671.0	15.0	4.0	0.5	Unknown rounded object, similar to storage tank or pipe
SSST-2	592047.2	720777.1	52.0	22.0	low lying	Linear object, possible pipe, log, or edge of buried barge
SSST-3	592198.7	715626.5	20.0	8.0	4.0	Possible boat on edge of rock pile
SSST-4	587985.1	706293.2	105.0	30.0	low lying	Mostly buried remains of a barge
SSST-5	587887.8	706193.5	80.0	27.0	low lying	Mostly buried remains of a barge
SSST-6	585141.8	699584.9	24.0	8.0	1.5	Submerged remains of a boat
SSST-7	586497.1	703310.6	16.0	6.0	4.0	Unknown debris/object
SSST-8	586763.8	703682.1	23.0	7.0	2.0	Unknown debris/object
SSST-9	589485.4	709069.3	250.0	150.0	pile	Large, shallow pile of rocks
SSST-10	584937.4	700338.6	68.0	22.0	low lying	Probable remains of a mostly buried barge
SSST-11	587104.5	705358.6	32.0	10.0	2.0	Submerged remains of a boat
SSST-12	584952.5	699288.9	30.0	2.0	0.5	Linear object, possible pipe, piling, or log
SSST-13	590578.4	692980.0	36.0	20.0	1.5	Unknown object, pile of debris
SSST-14	586952.5	692358.1	100.0	30.0	1.0	Debris pile
SSST-15	584952.7	699223.9	36.0	2.0	0.5	Unknown object
SSST-16	590028.6	692444.8	15.0	5.0	2.0	Unknown object
SSST-17	598357.3	694256.1	145.0	100.0	4.0	Piles of lumber, logs, or debris
SSST-18	596506.4	731818.3	24.0	3.0	1.0	Unknown debris, probably logs
SSST-19	596303.4	729919.1	105.0	29.0	3.0	Mostly submerged remains of barge
SSST-20	597474.1	736050.2	13.0	5.0	2.0	Unknown debris/object
SSST-21	596314.6	731563.1	21.0	9.0	low lying	Unknown debris/object
SSST-22	596815.9	728594.6	45.0	32.0	low lying	Unknown debris, possible barge or dock remains
SSST-23	600650.4	739752.1	11.0	7.0	2.5	Large boulder
Wreck	594802.2	723987.2	80	16	low lying	Unknown vessel remains, investigation recommended if impacted

Table 3. Locations and descriptions of additional sonar targets.

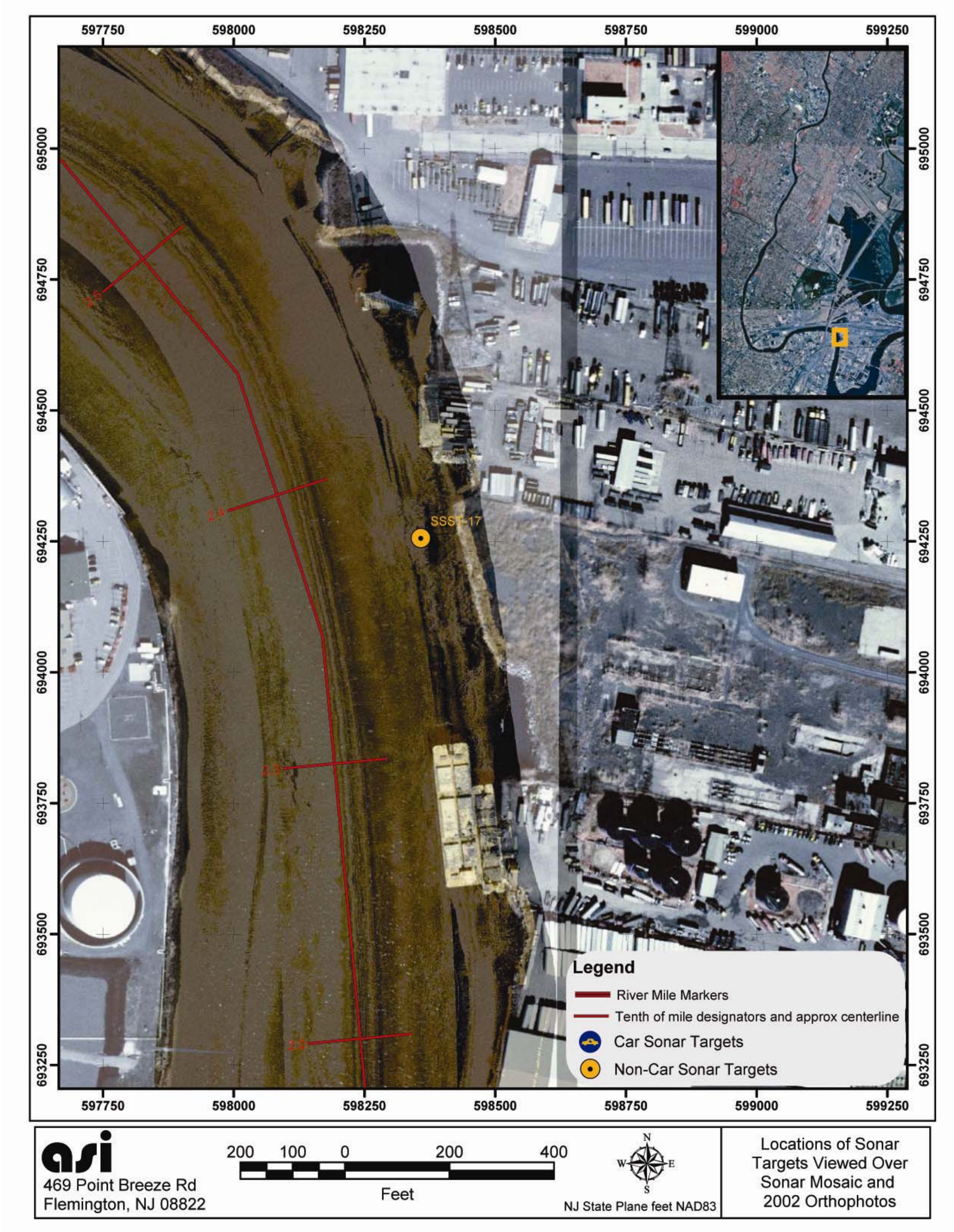


Figure 39. Location of sonar target SSST-17.

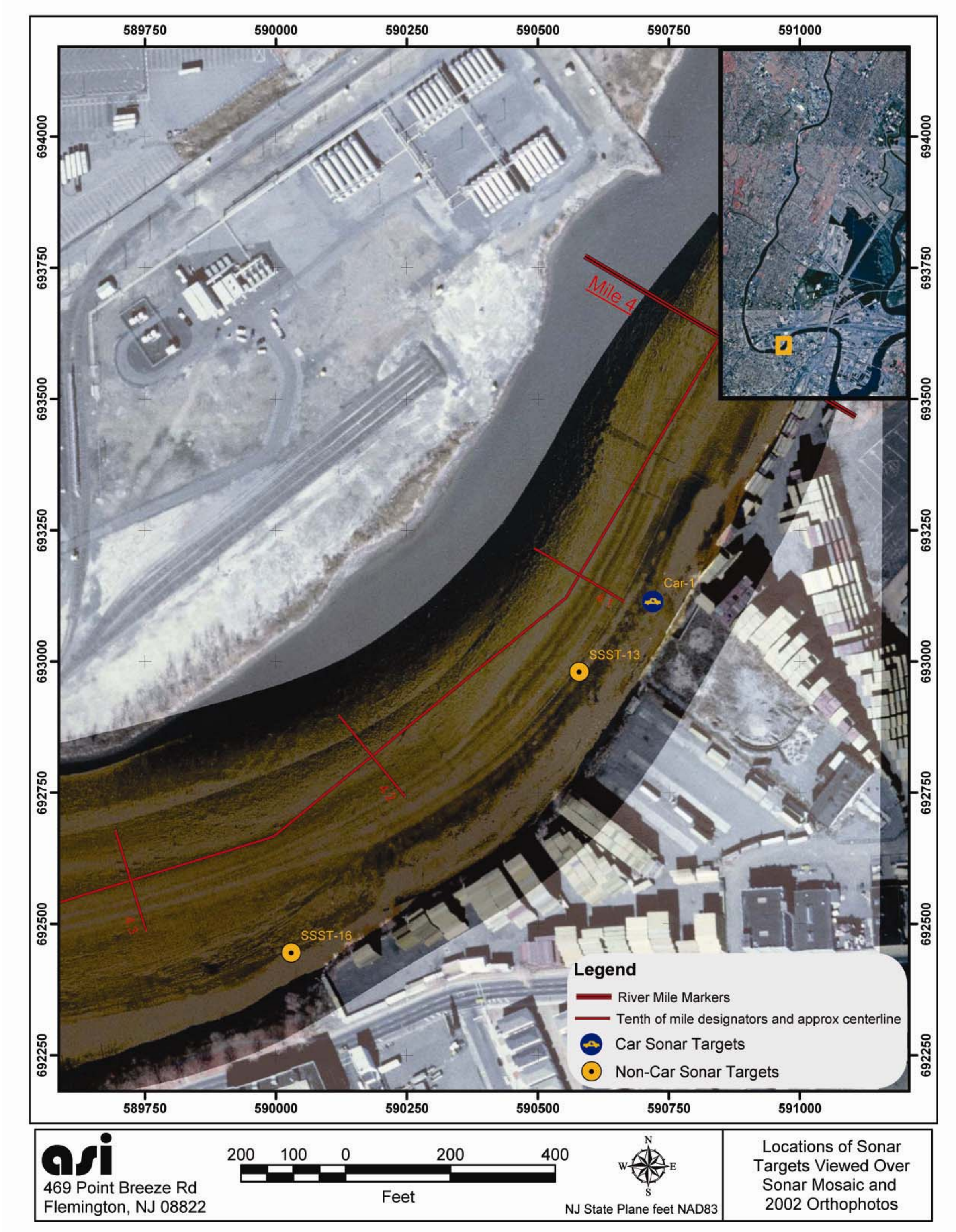


Figure 40. Locations of sonar targets Car-1, SSST-13 and SSST-16.

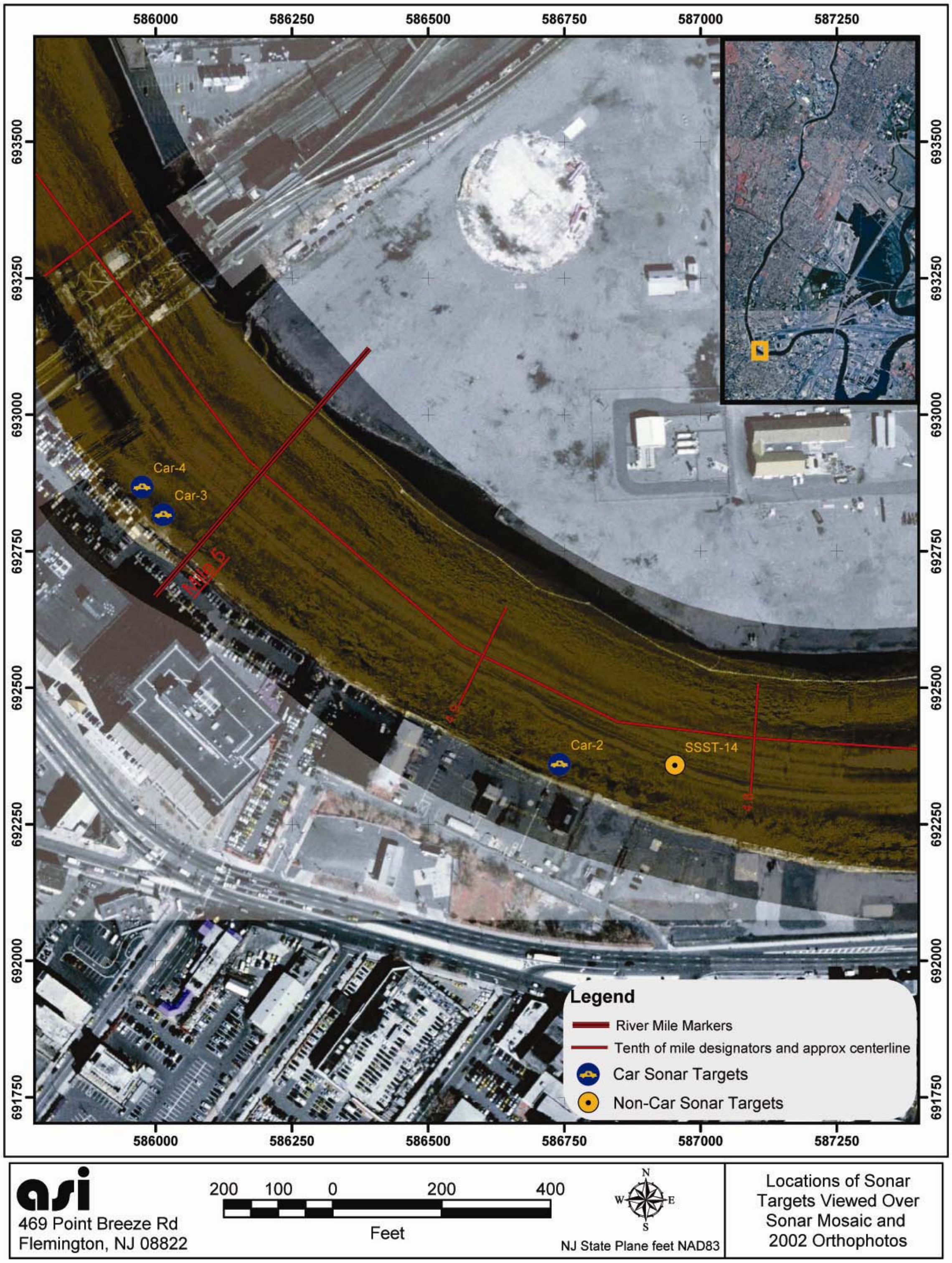


Figure 41. Locations of sonar targets Car-2 to Car-4 and SSST-14.

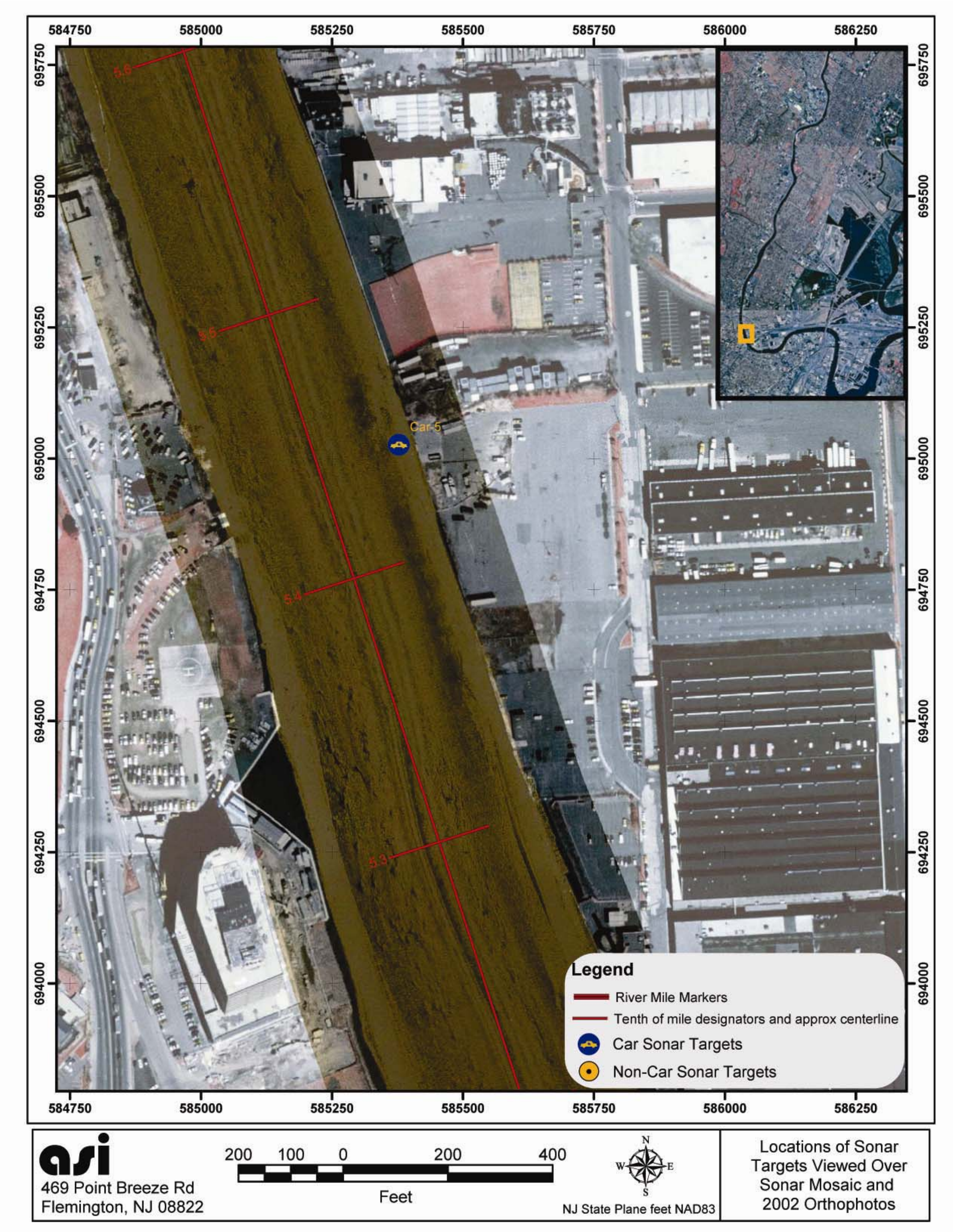


Figure 42. Location of sonar target Car-5.

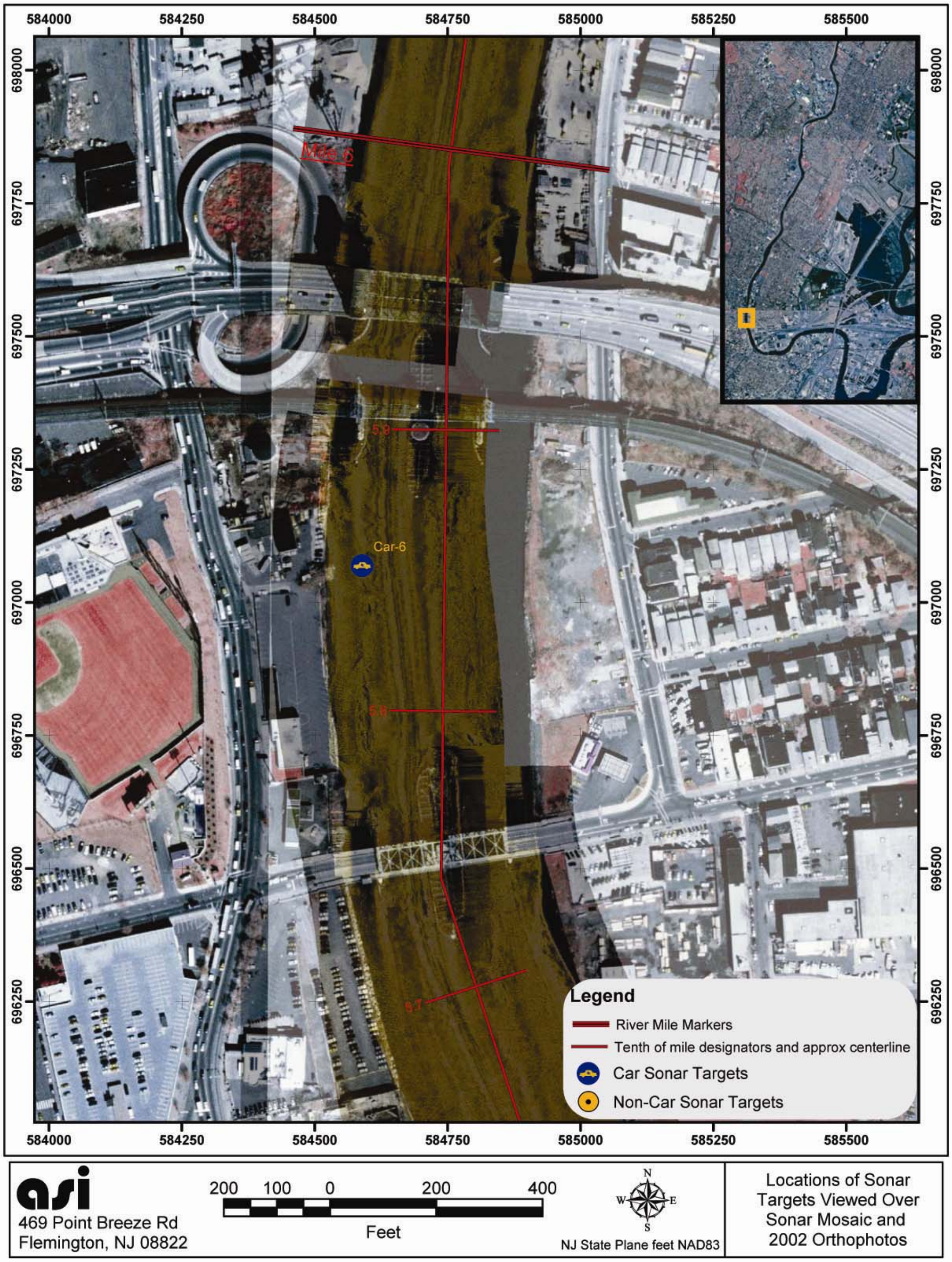


Figure 43. Location of sonar target Car-6.

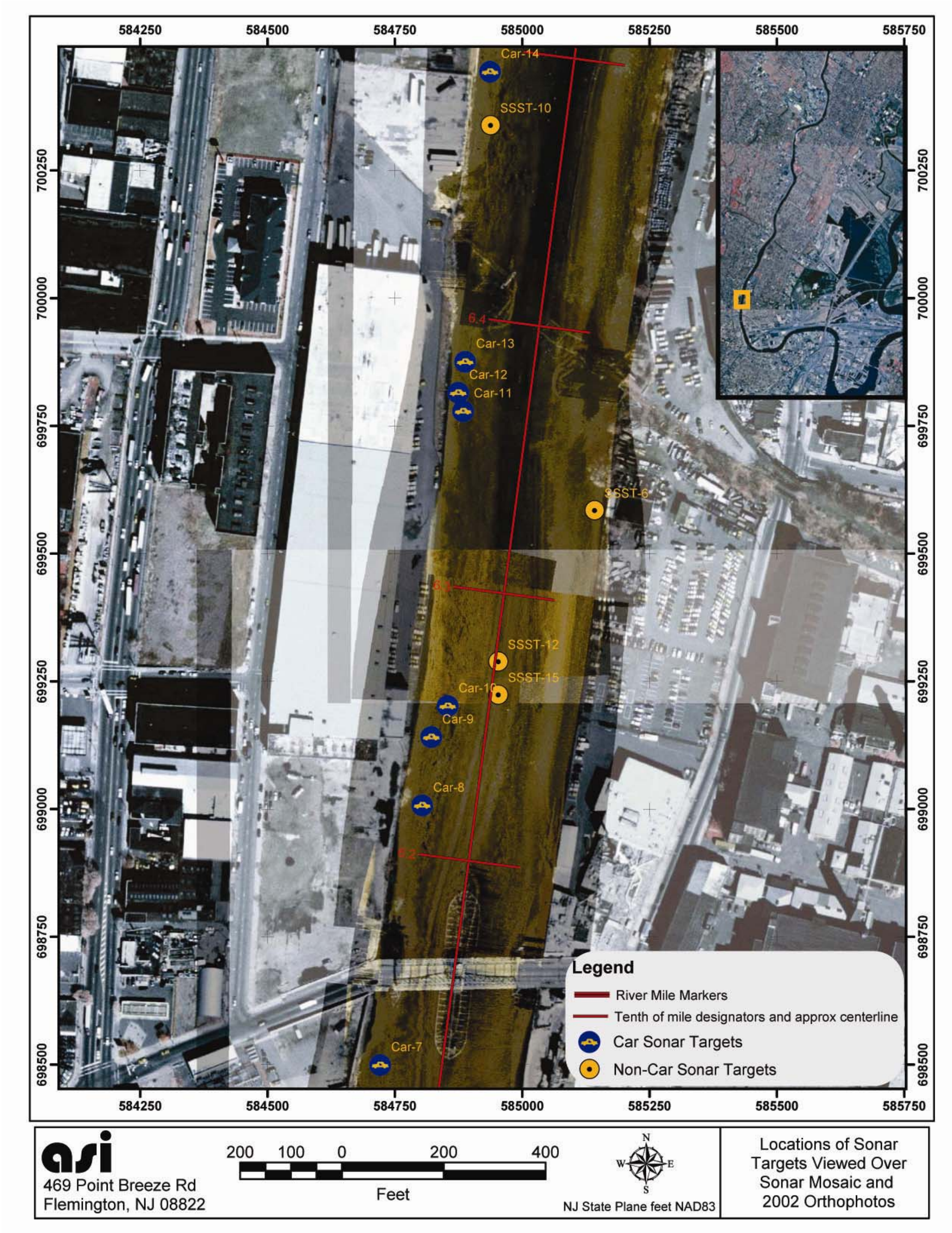


Figure 44. Locations of sonar targets Car-7 to Car-14 and SSST-6, -10, -12, -15.

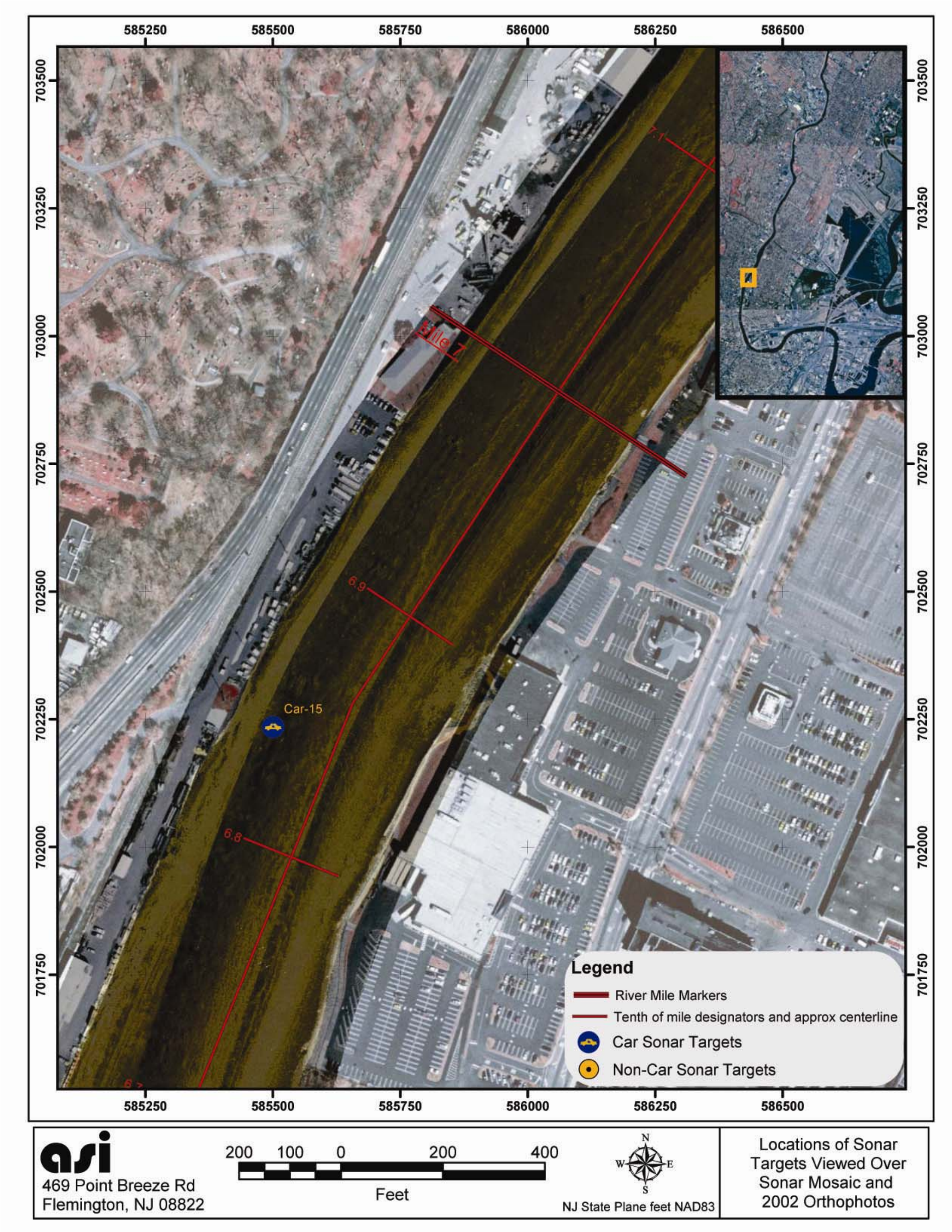


Figure 45. Location of sonar target Car-15.

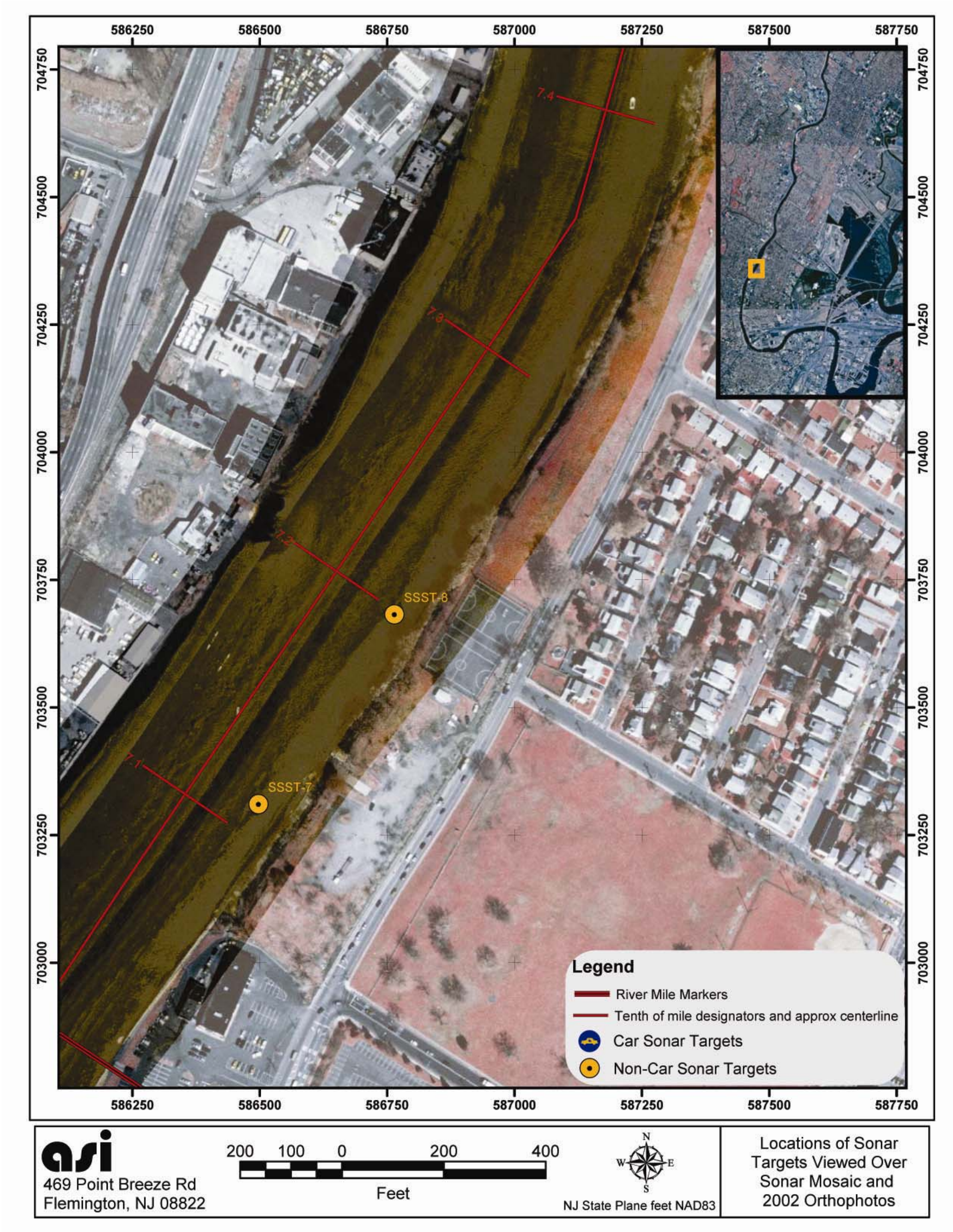


Figure 46. Locations of sonar targets SSST-7 and SSST-8.

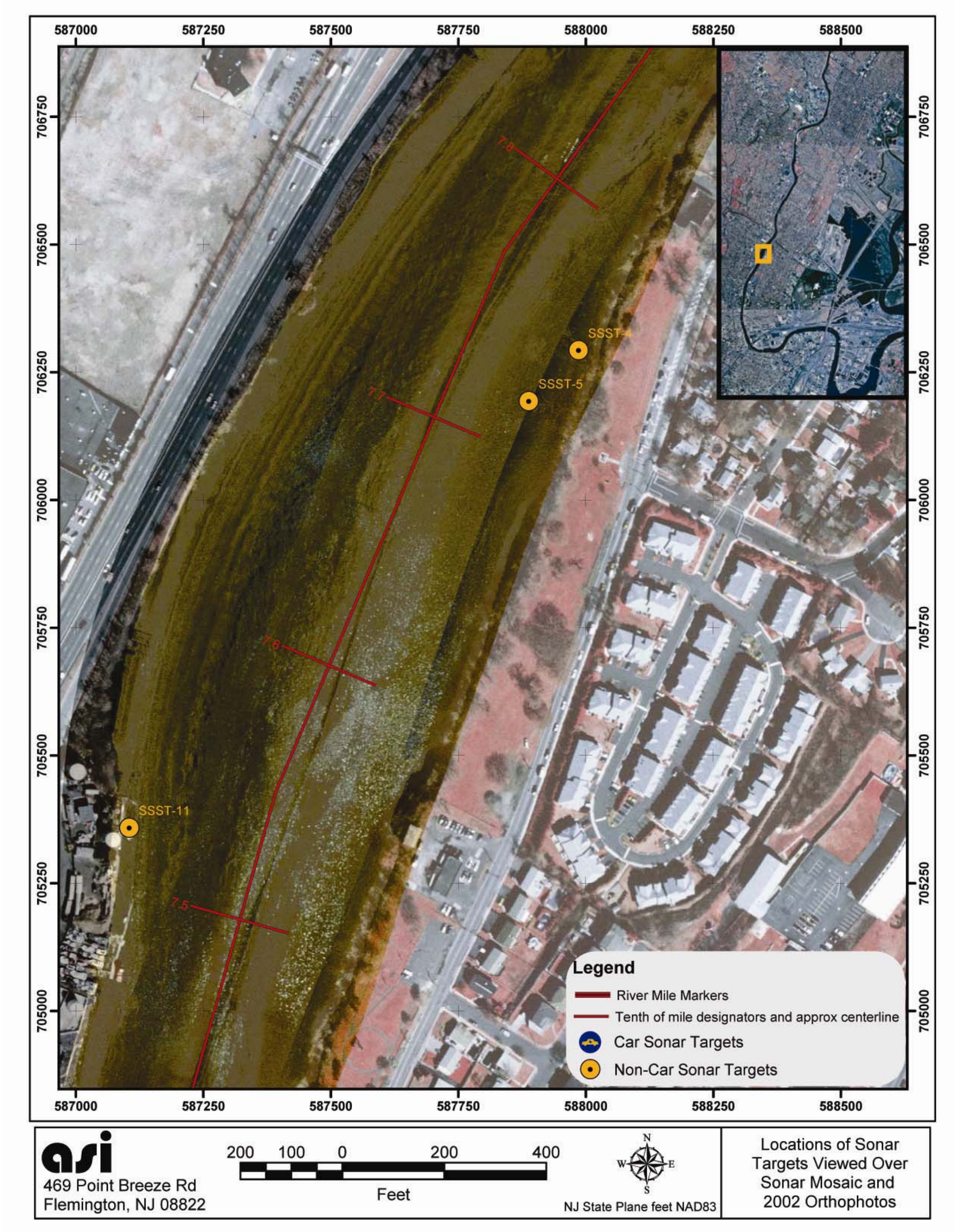


Figure 47. Locations of sonar targets SSST-4, SSST-5, and SSST-11.

Figure 48. Location of sonar target SSST-9.

R2-0007327

Figure 49. Location of sonar target SSST-3.

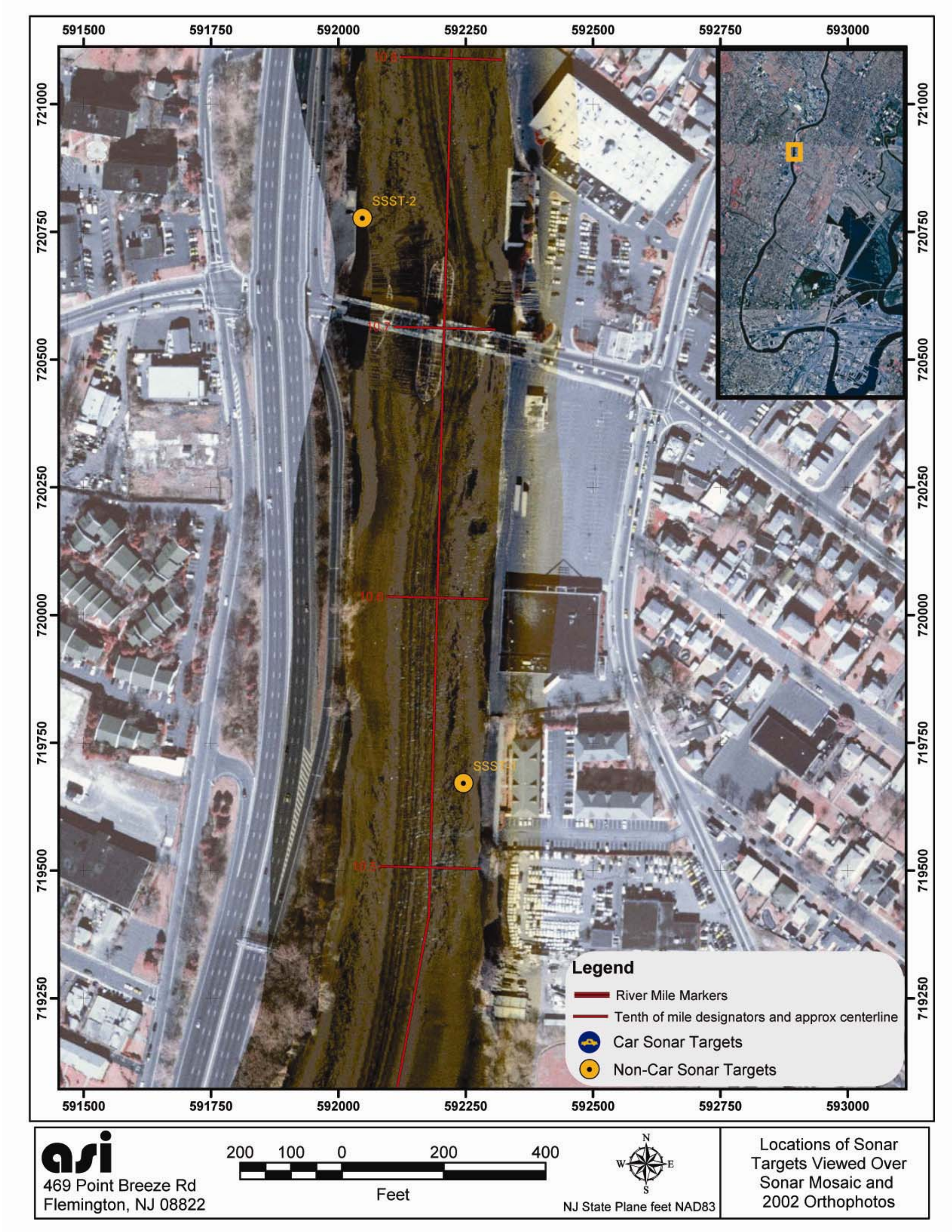


Figure 50. Locations of sonar targets SSST-1 and SSST-2.

Figure 51. Location of sonar target Wreck.

Figure 52. Location of sonar target SSST-22.

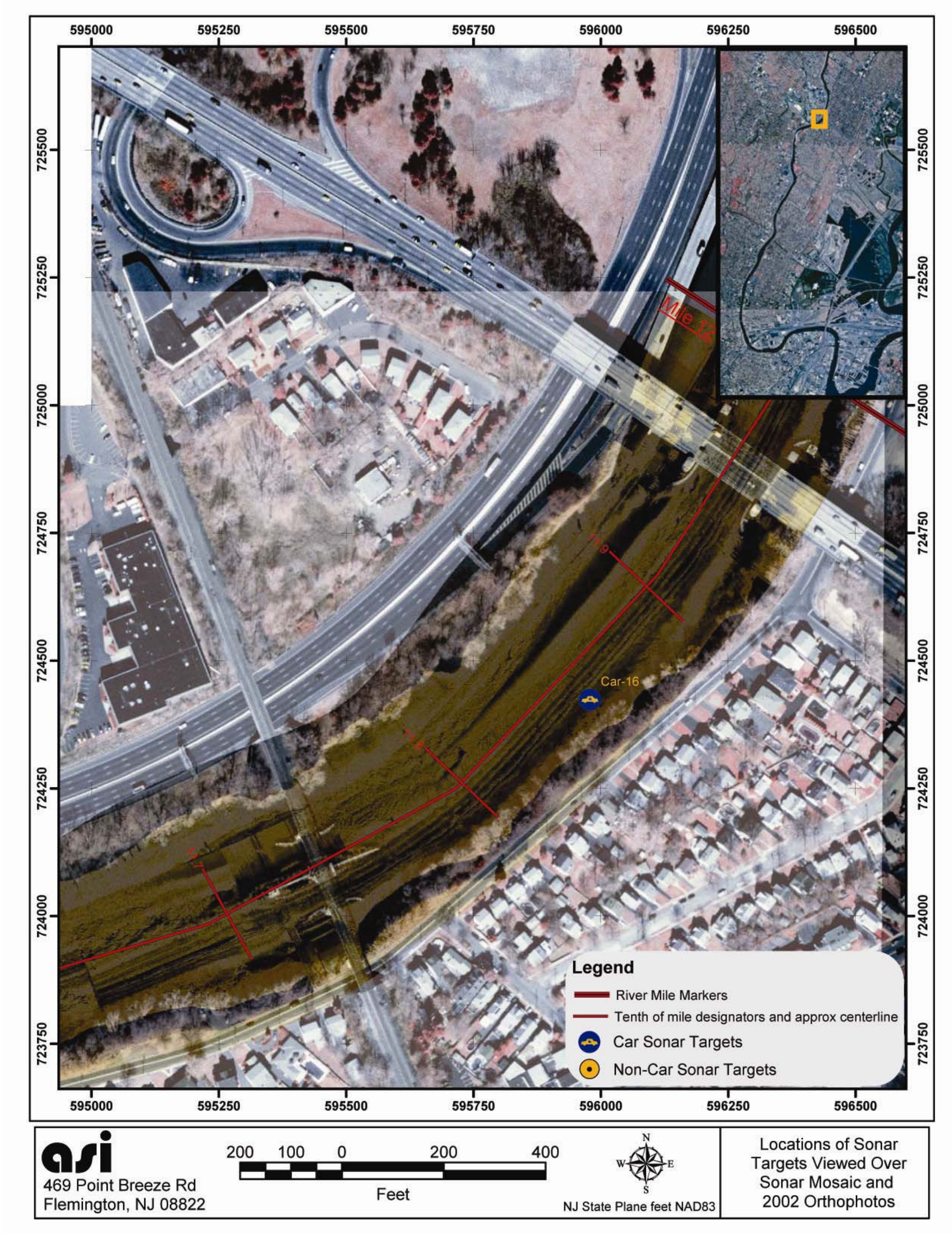


Figure 53. Location of sonar target Car-16.

Figure 54. Locations of sonar targets SSST-19.

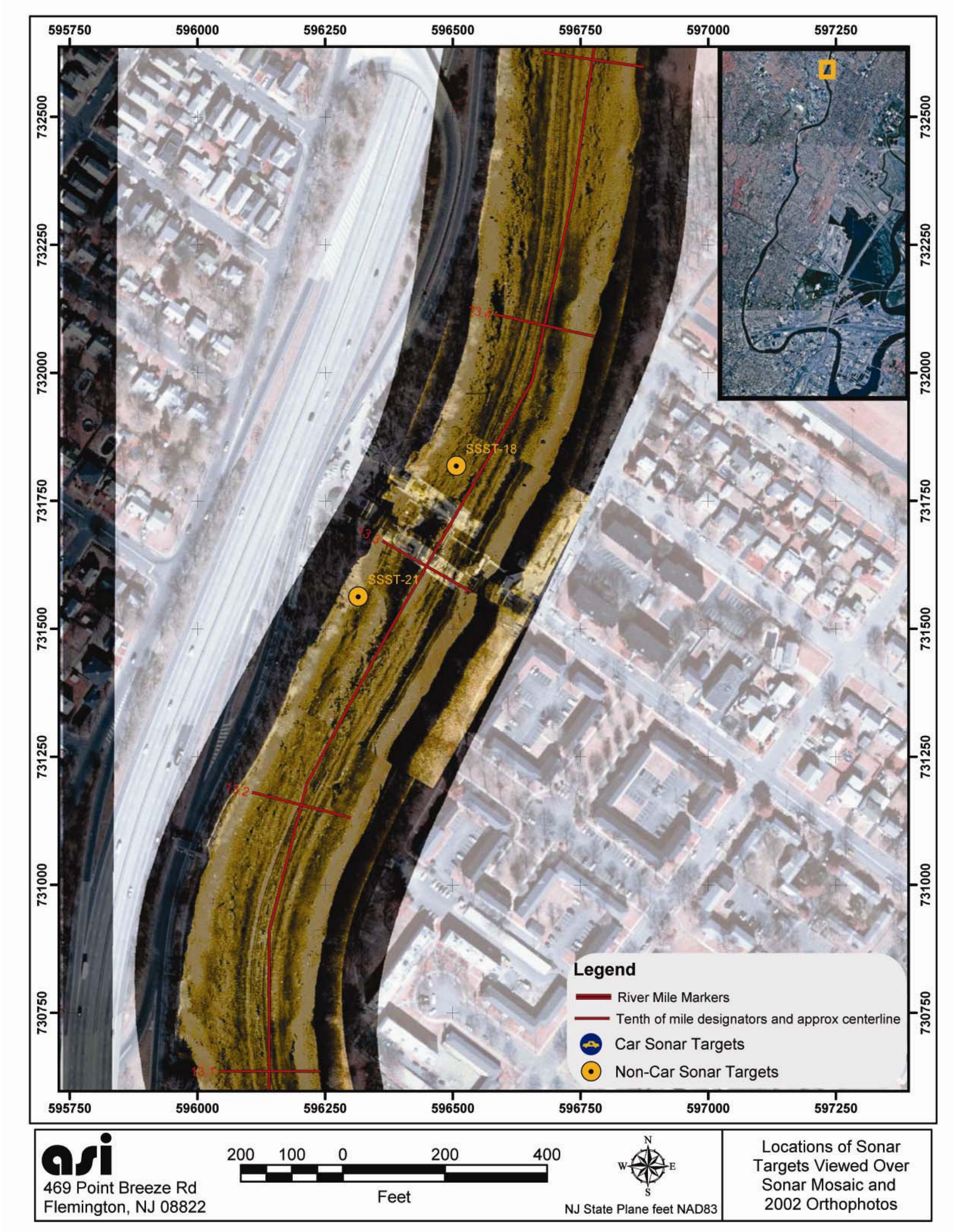


Figure 55. Locations of sonar targets SSST-18 and SSST-21.

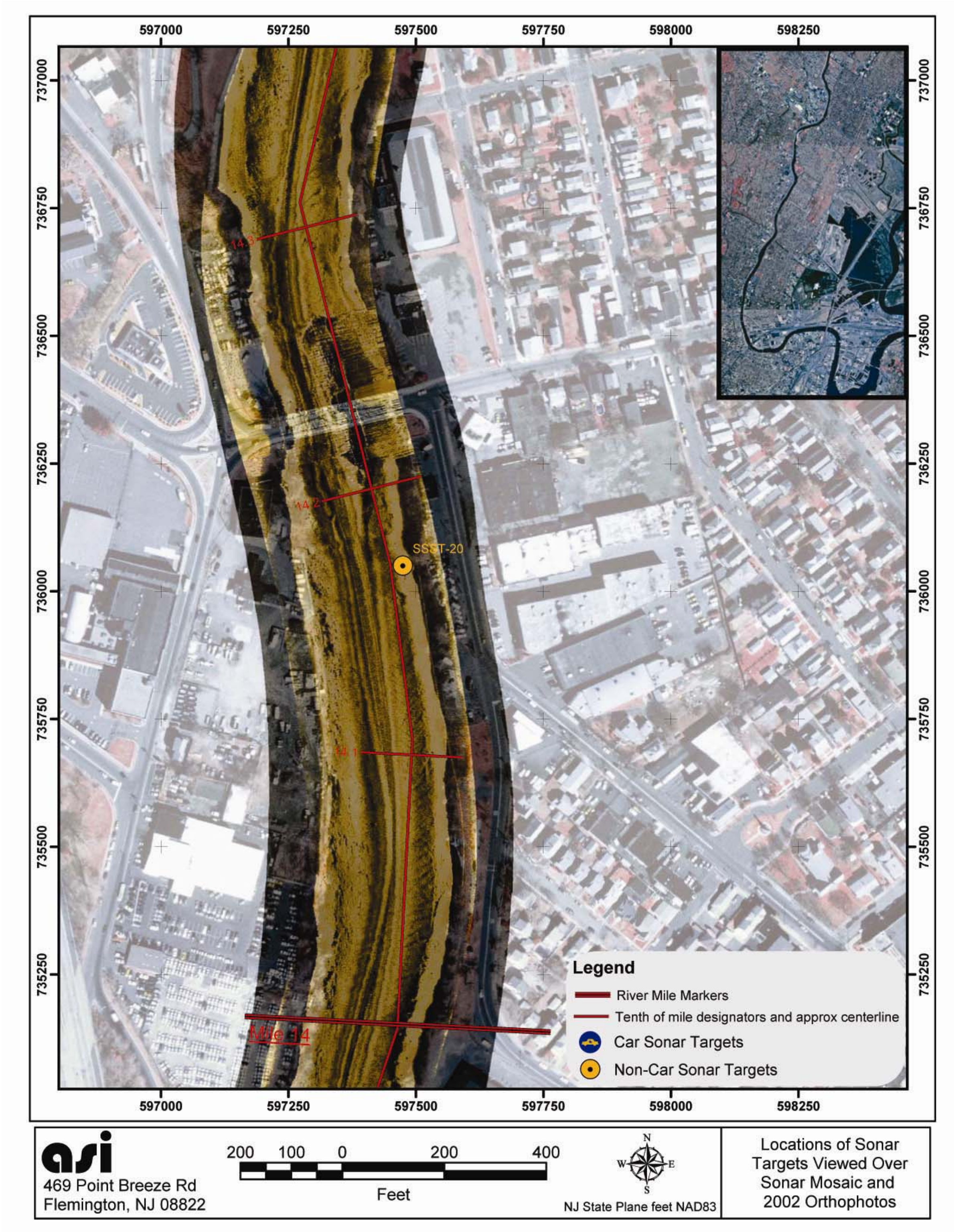


Figure 56. Location of sonar target SSST-20.

Figure 57. Location of sonar target SSST-23.

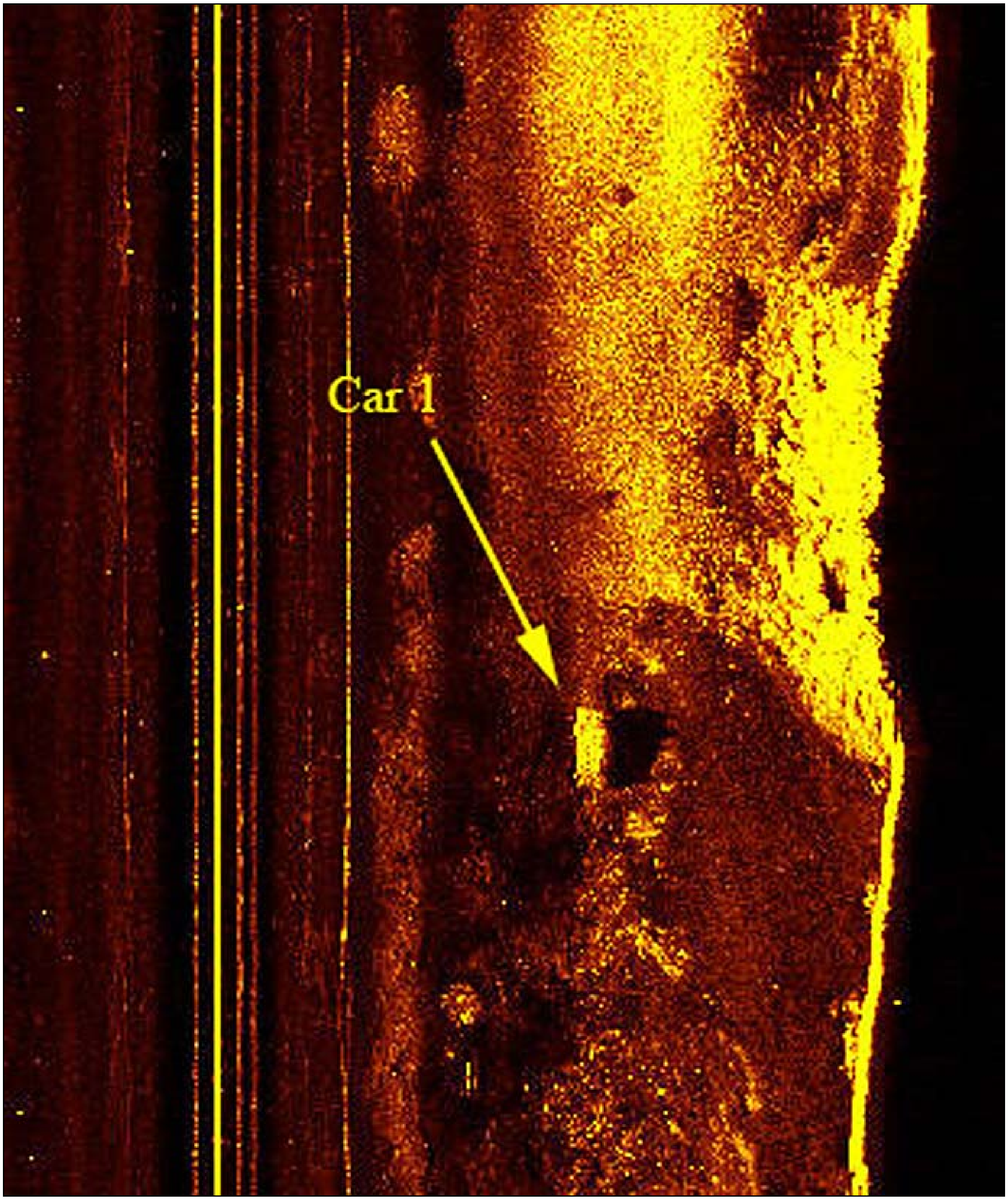


Figure 58. Sonar image of Car 1.

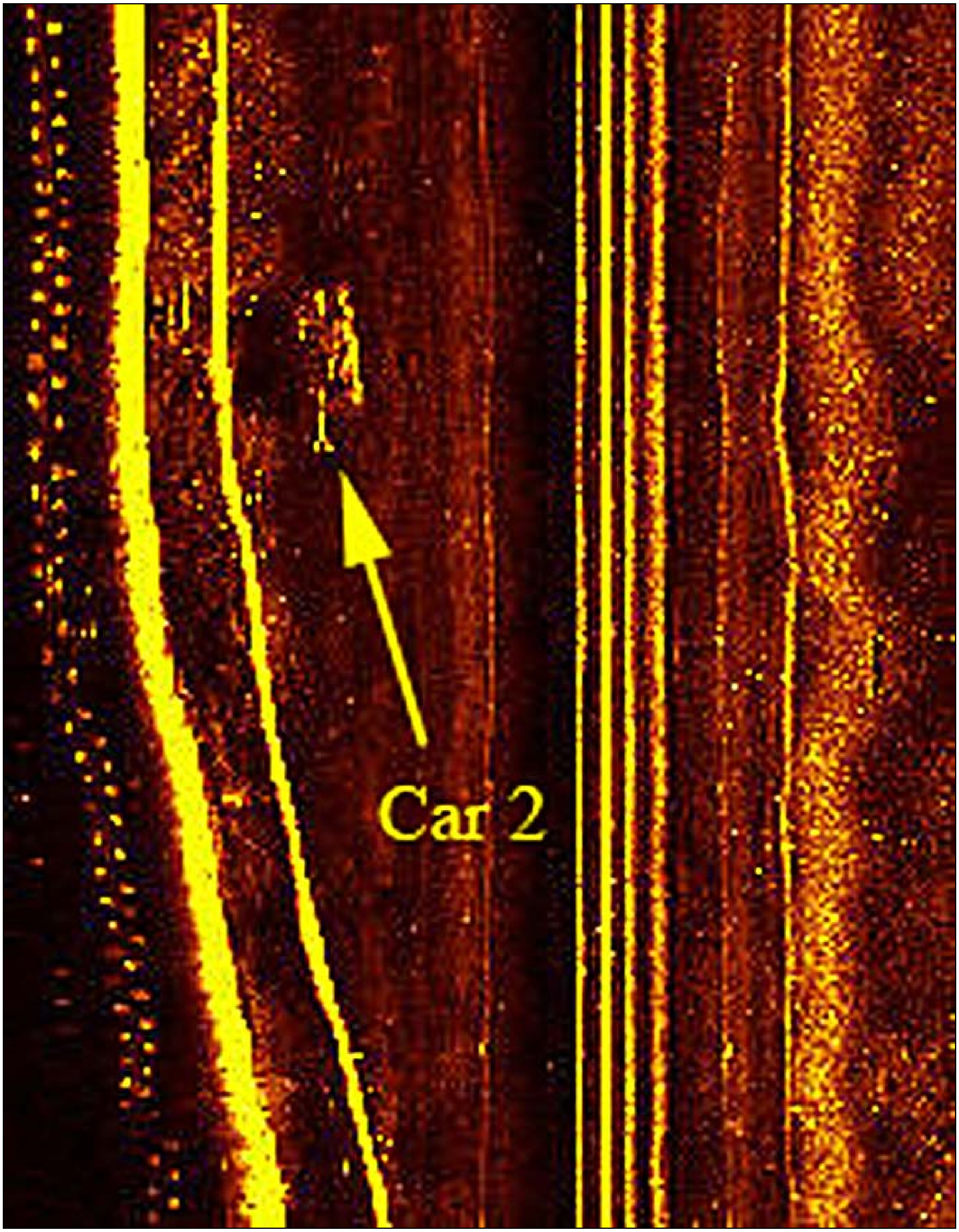


Figure 59. Sonar image of Car 2.

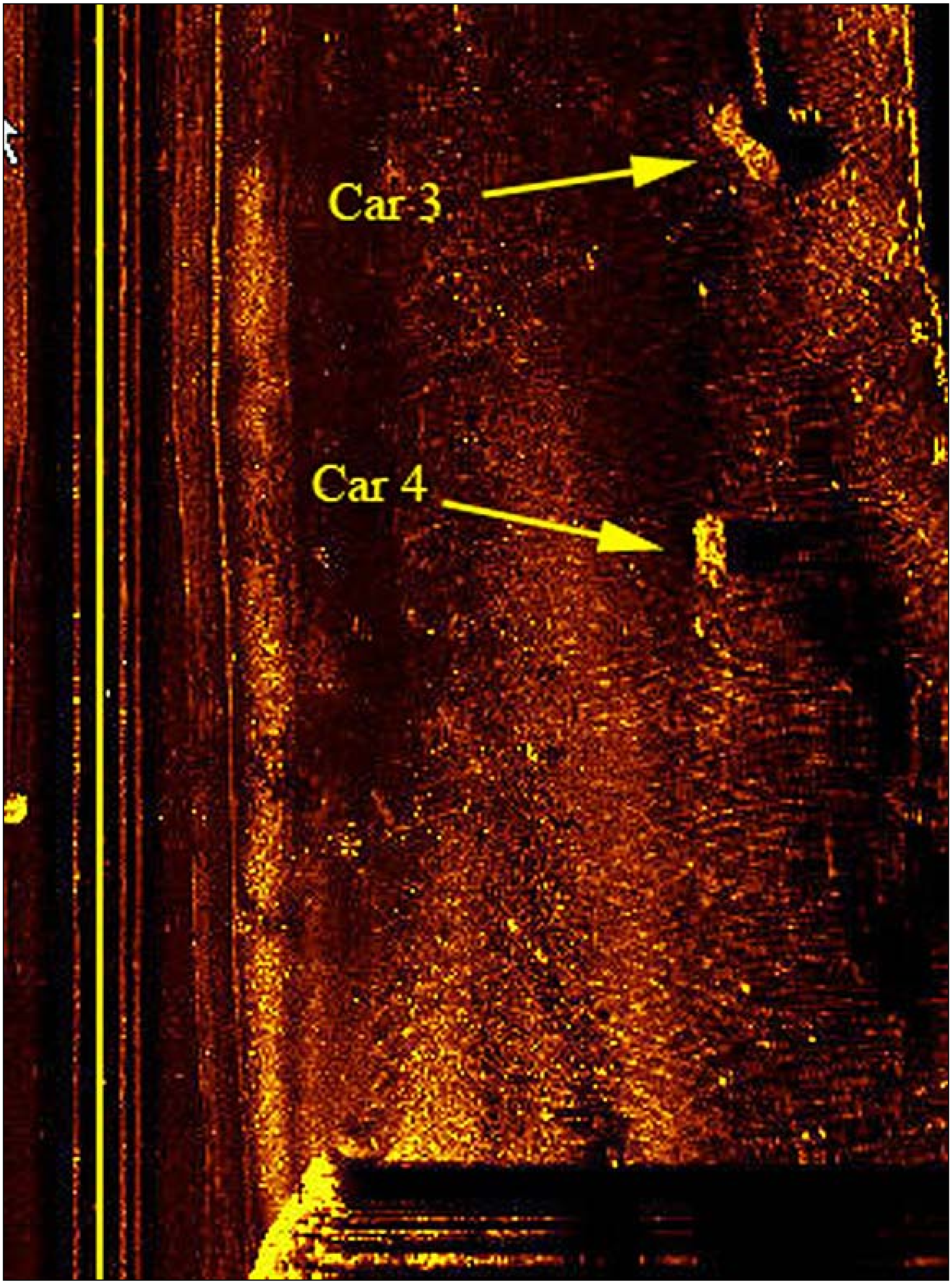


Figure 60. Sonar image of Cars 3 and 4.

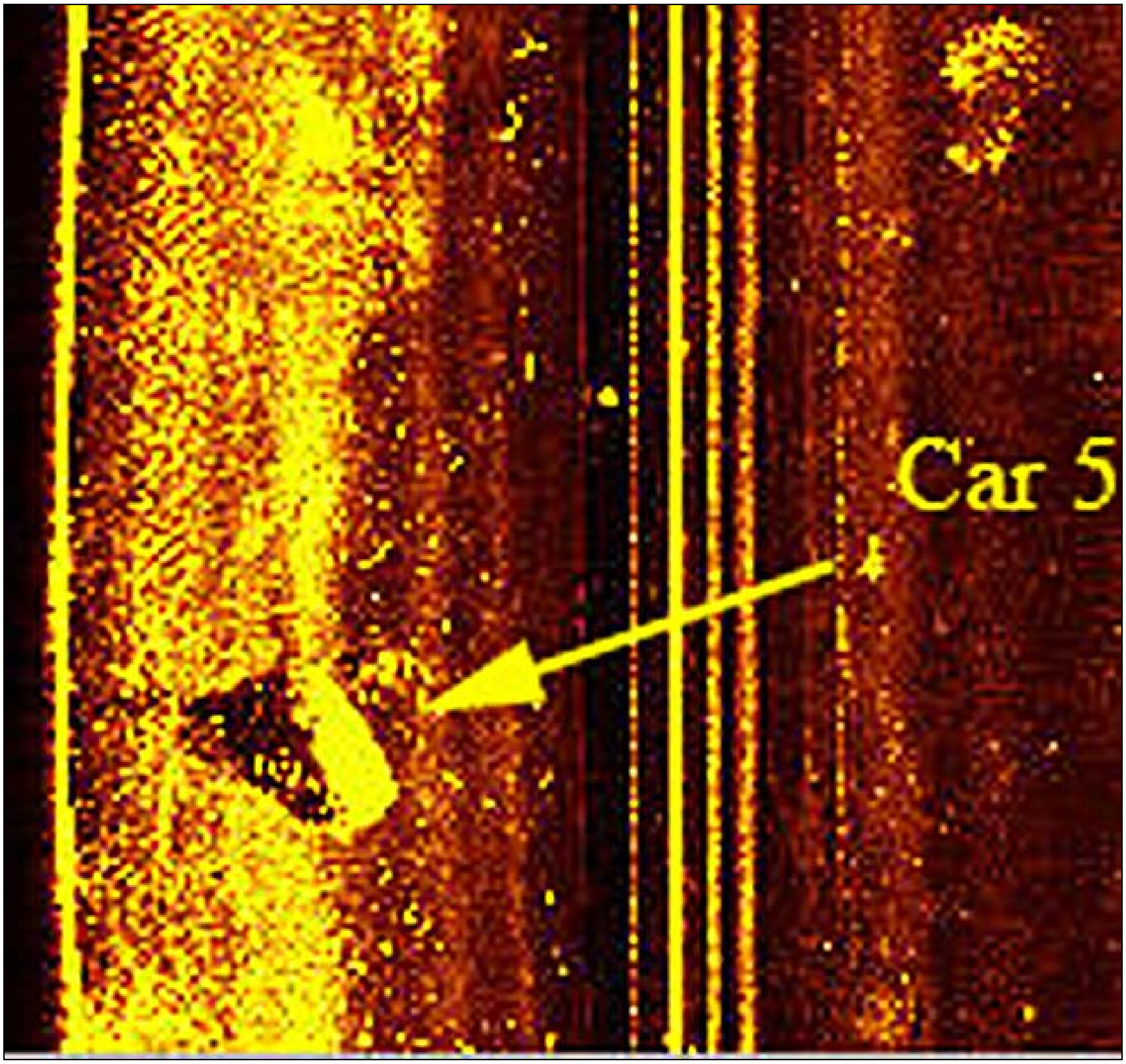


Figure 61. Sonar image of Car 5.

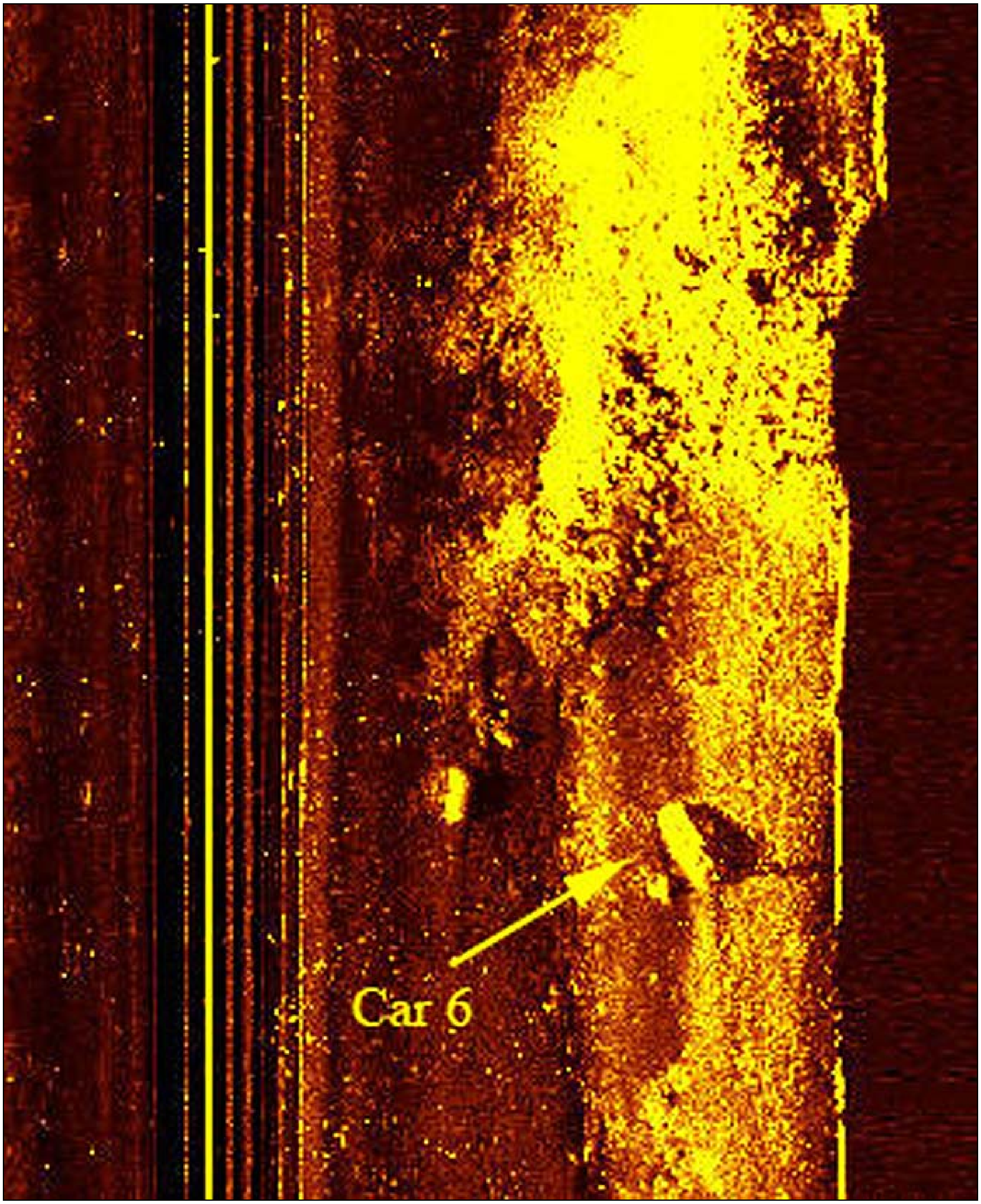


Figure 62. Sonar image of Car 6.

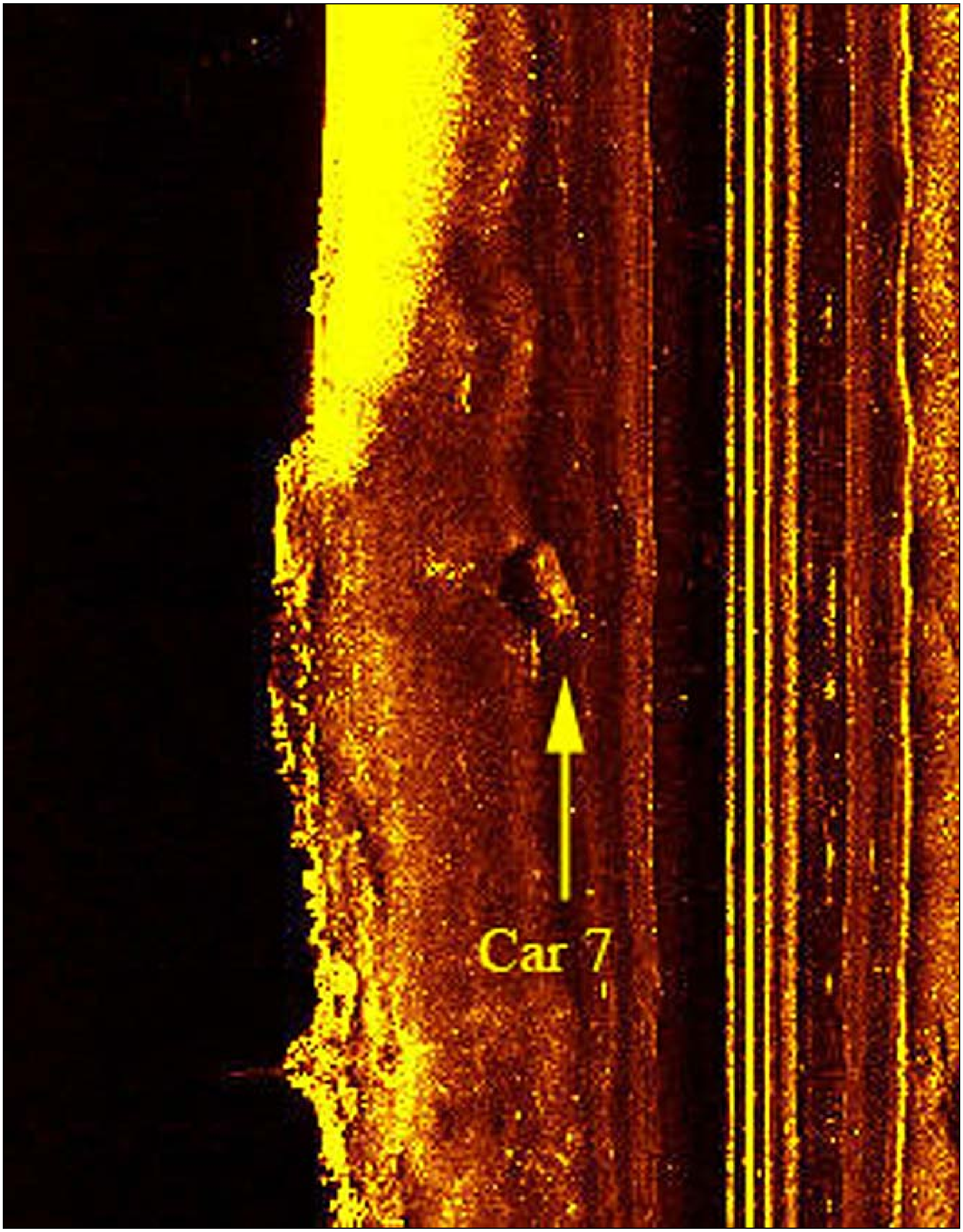


Figure 63. Sonar image of Car 7.

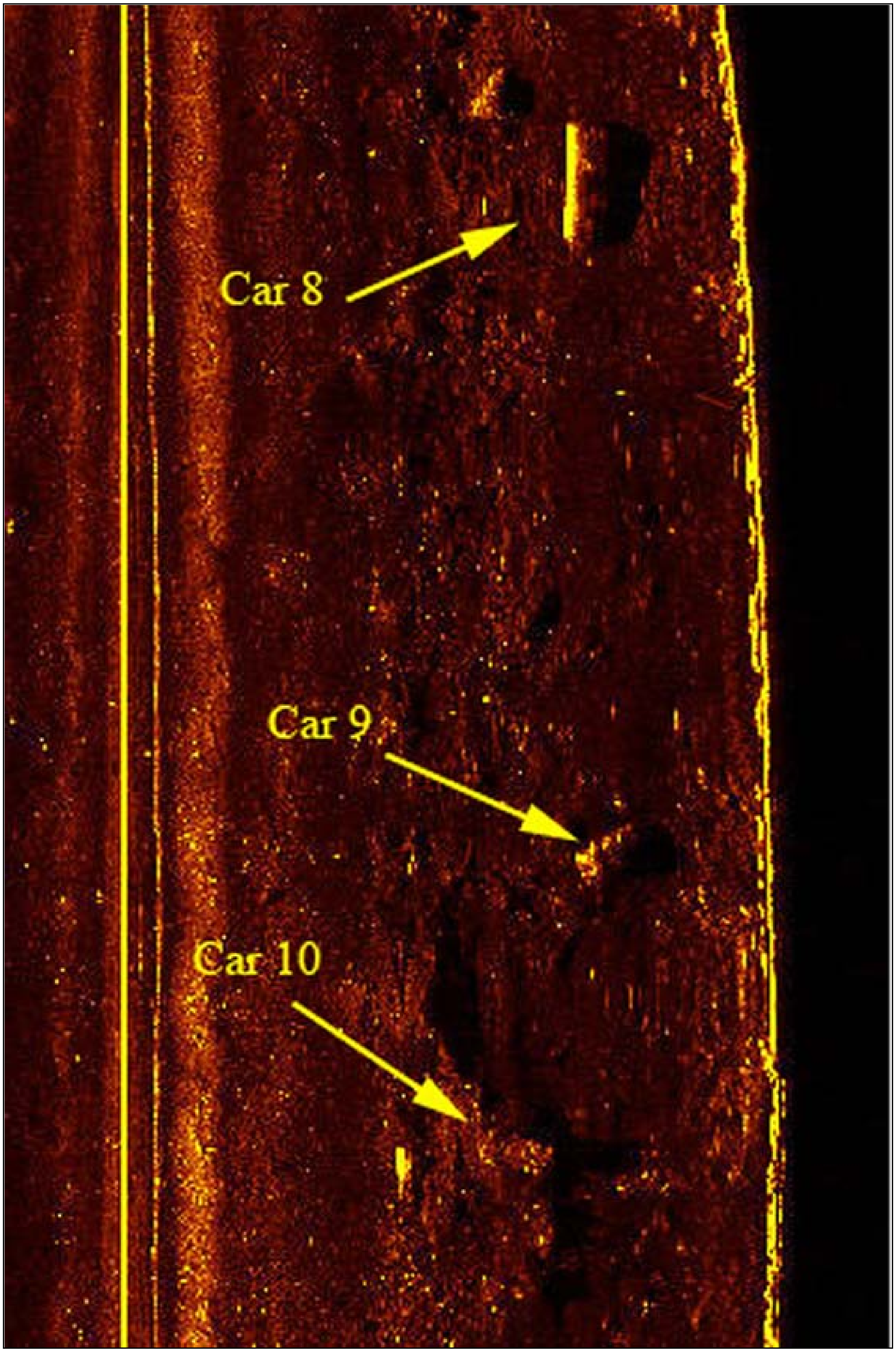


Figure 64. Sonar image of Cars 8, 9, and 10.

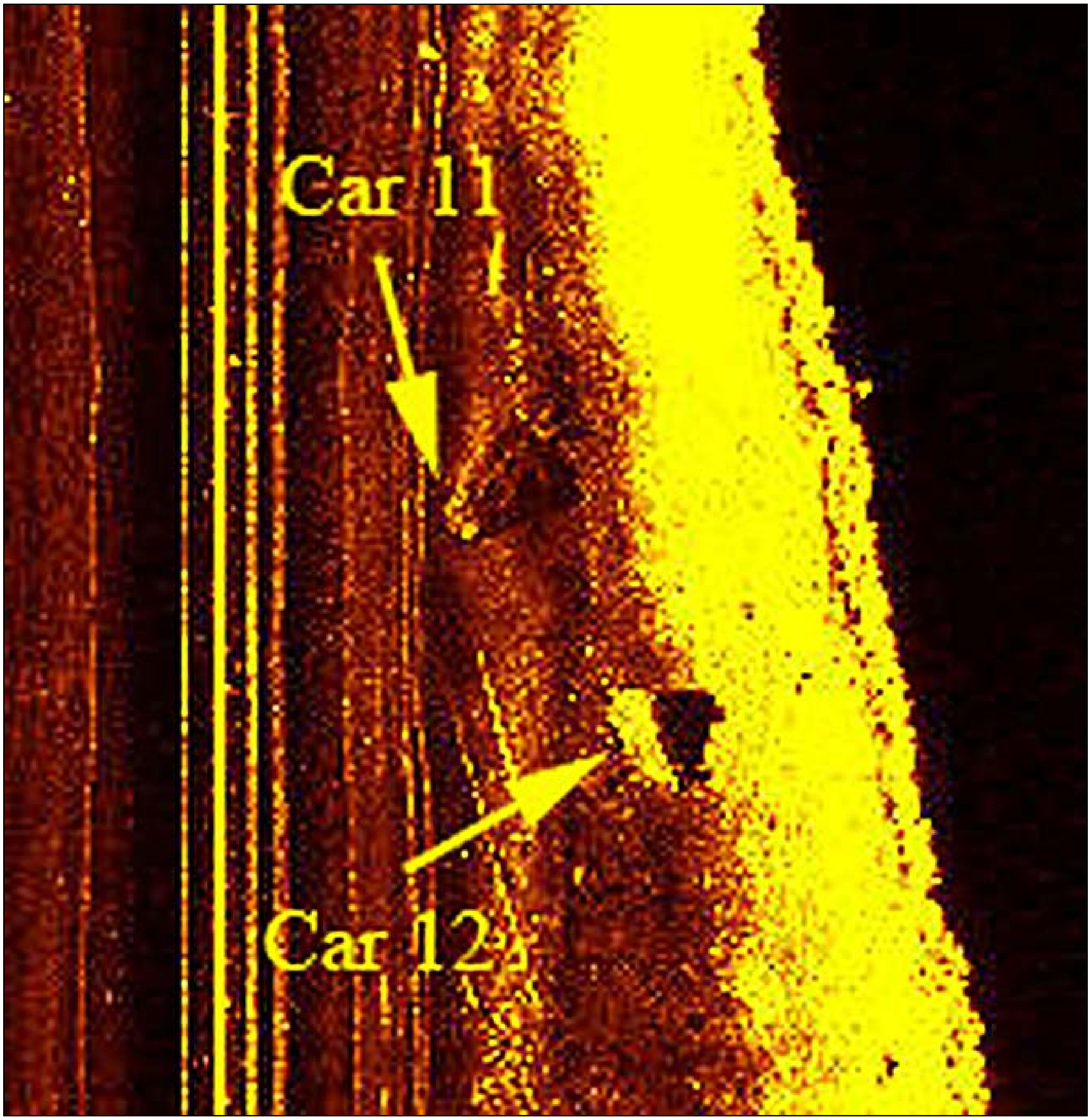


Figure 65. Sonar image of Cars 11 and 12.

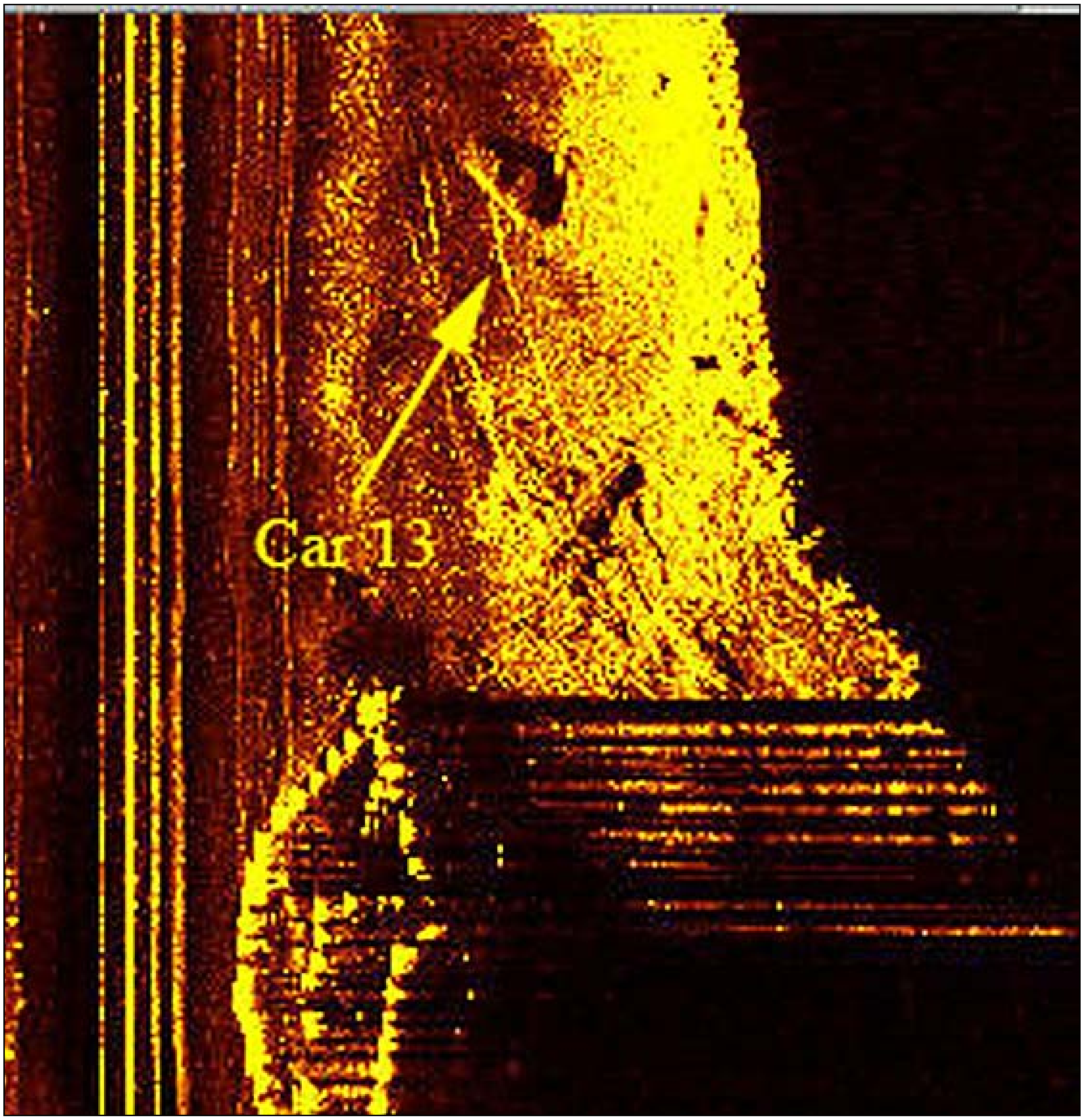


Figure 66. Sonar image of Car 13.

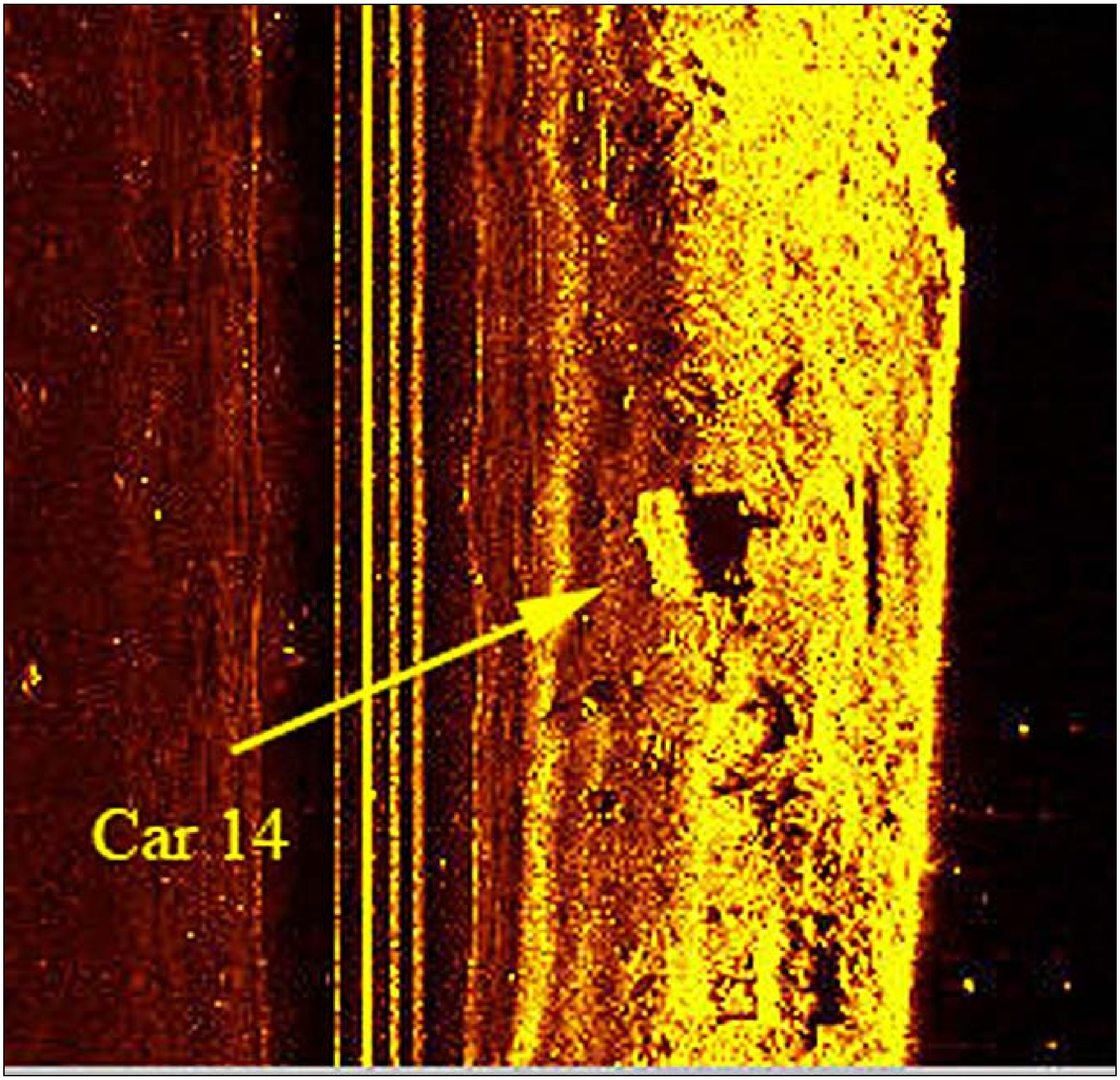


Figure 67. Sonar image of Car 14.

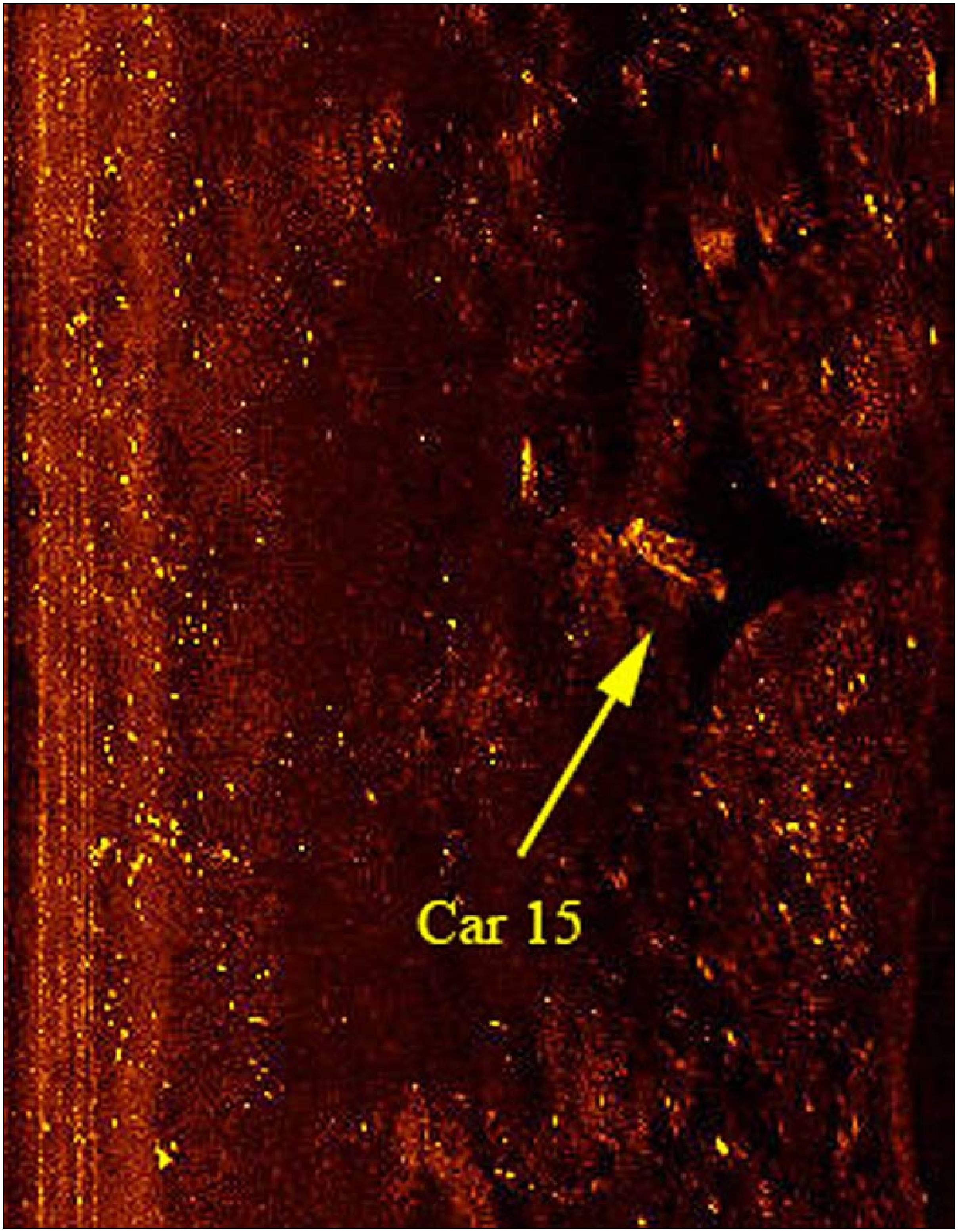


Figure 68. Sonar image of Car 15.

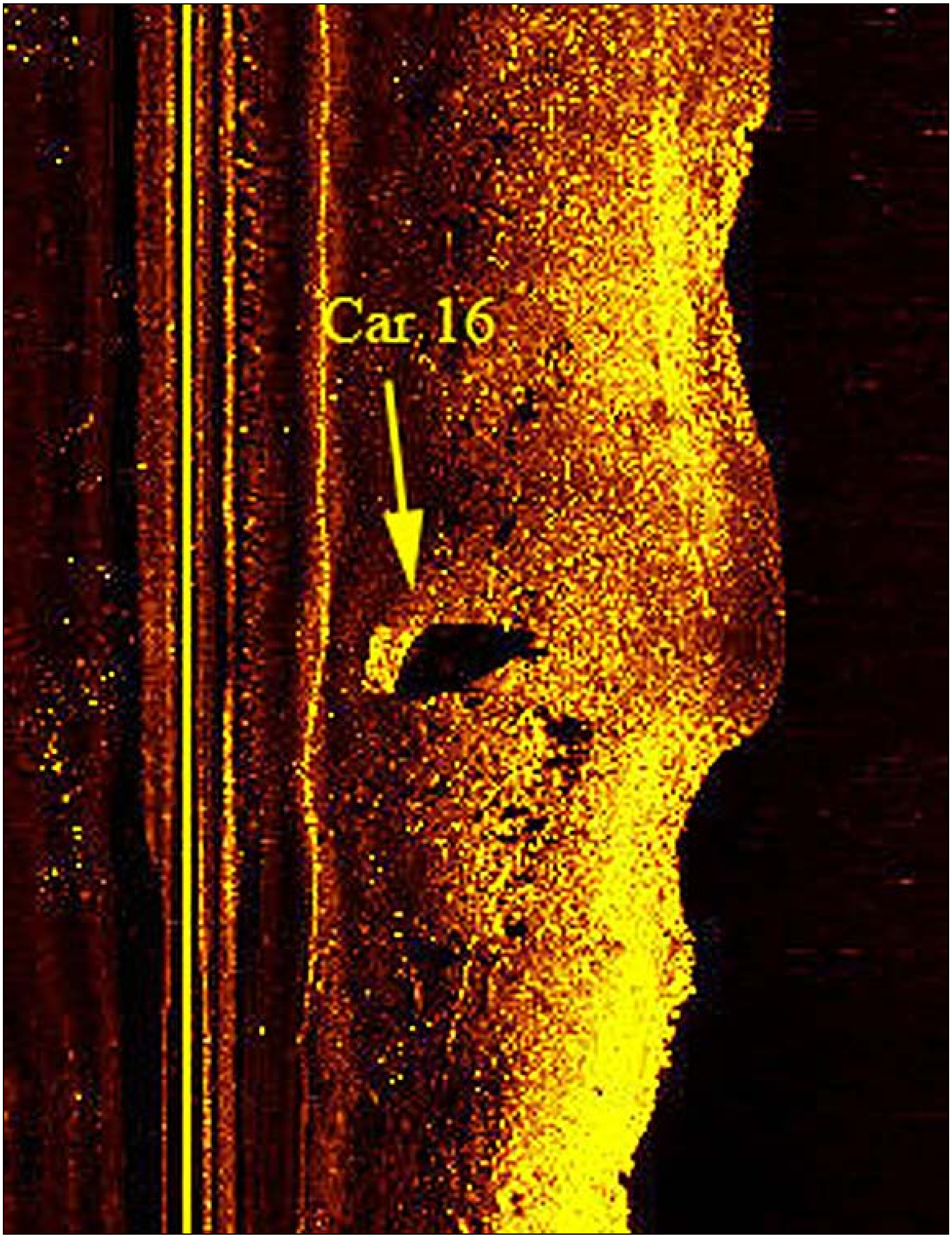


Figure 69. Sonar image of Car 16.

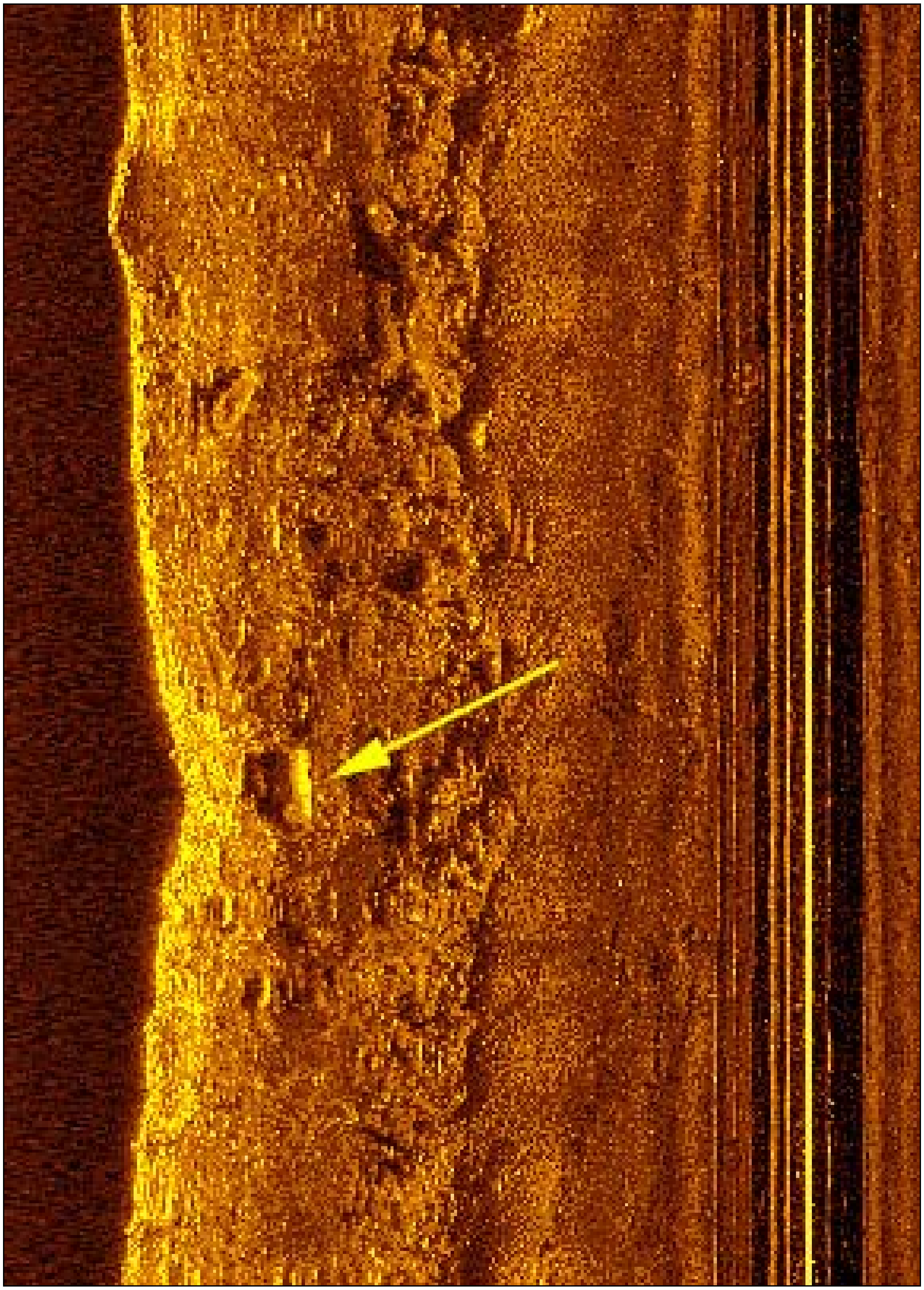


Figure 70. Sonar image of sonar target SSST-1.

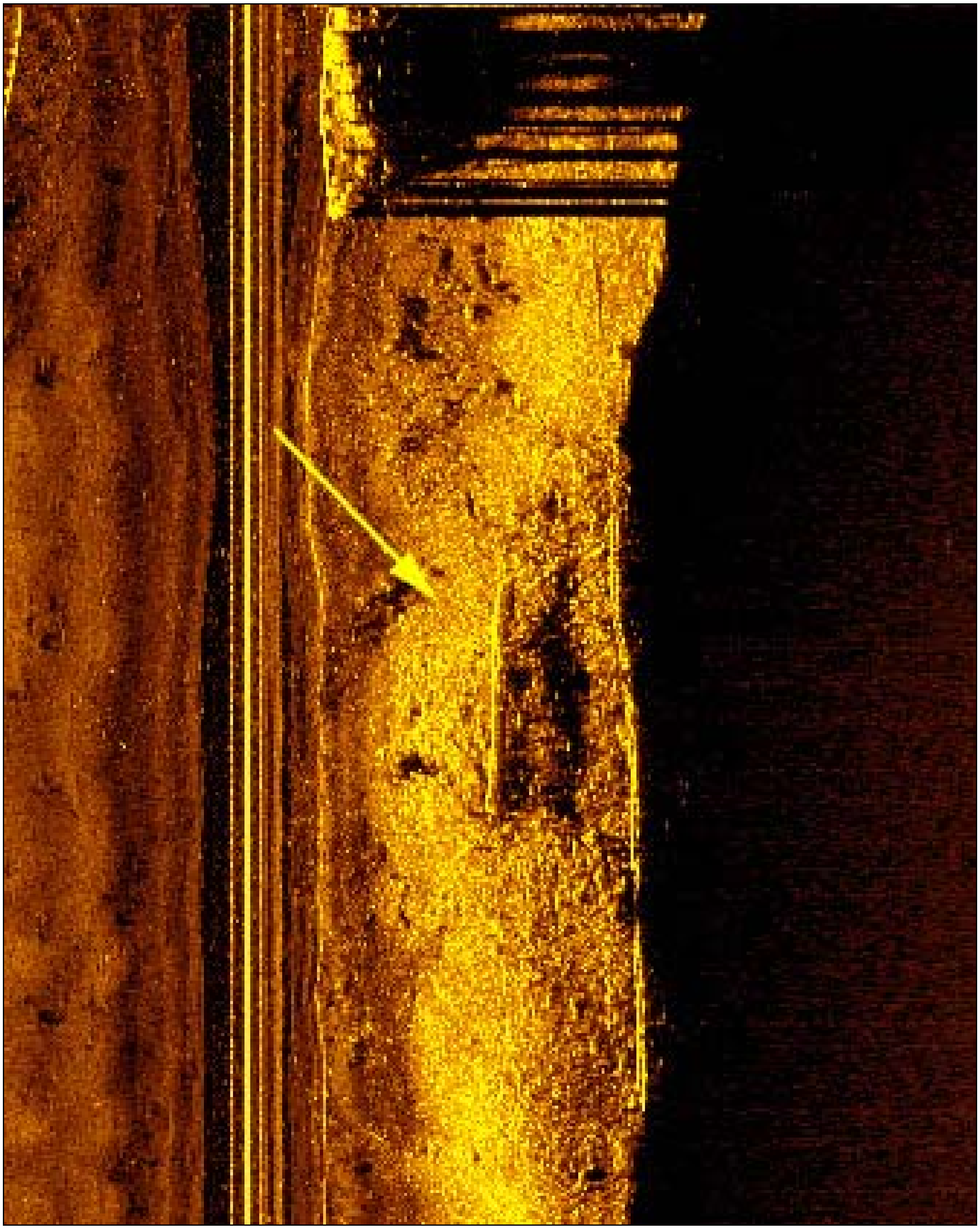


Figure 71. Sonar image of sonar target SSST-2.

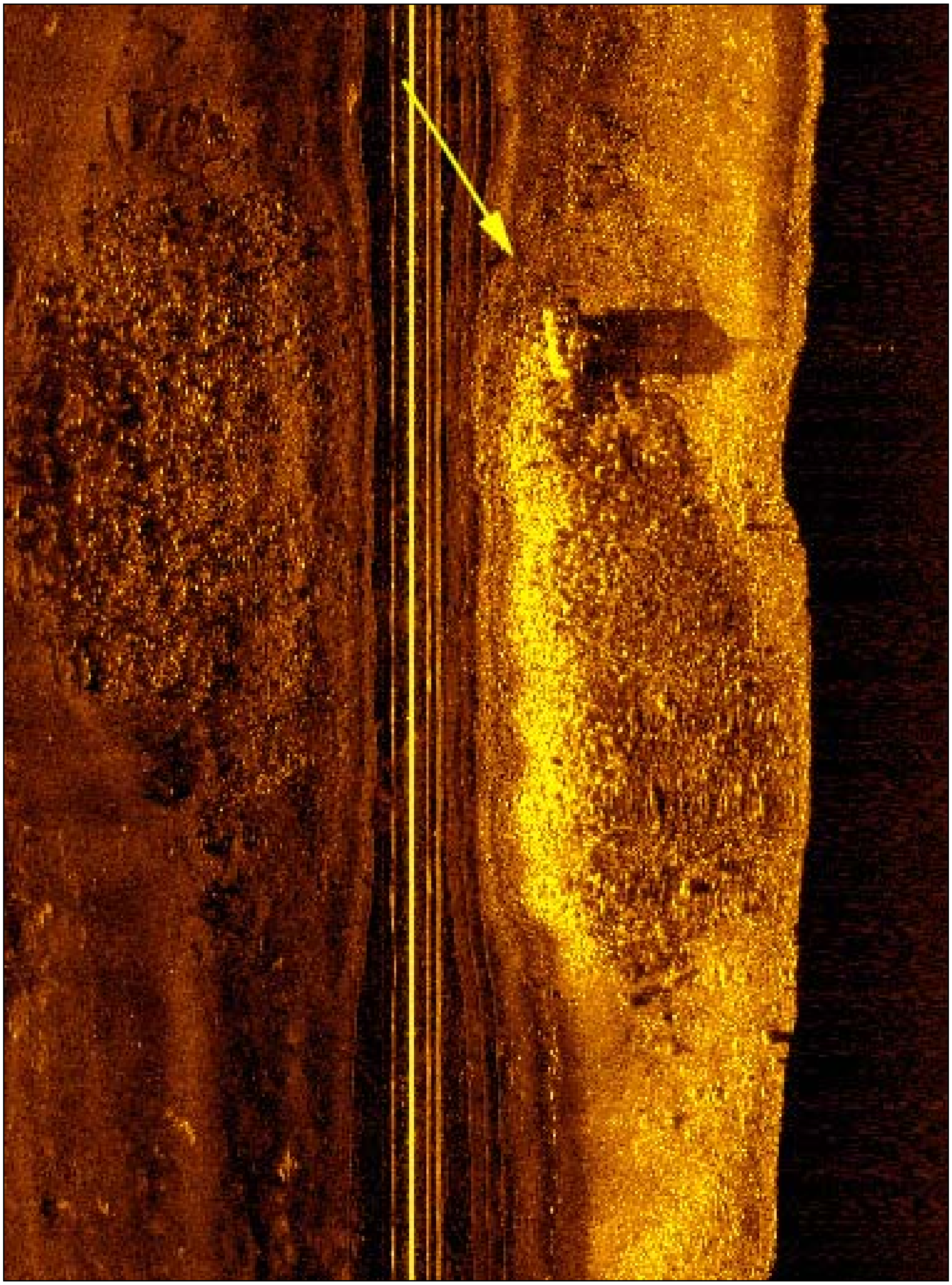


Figure 72. Sonar image of sonar target SSST-3.

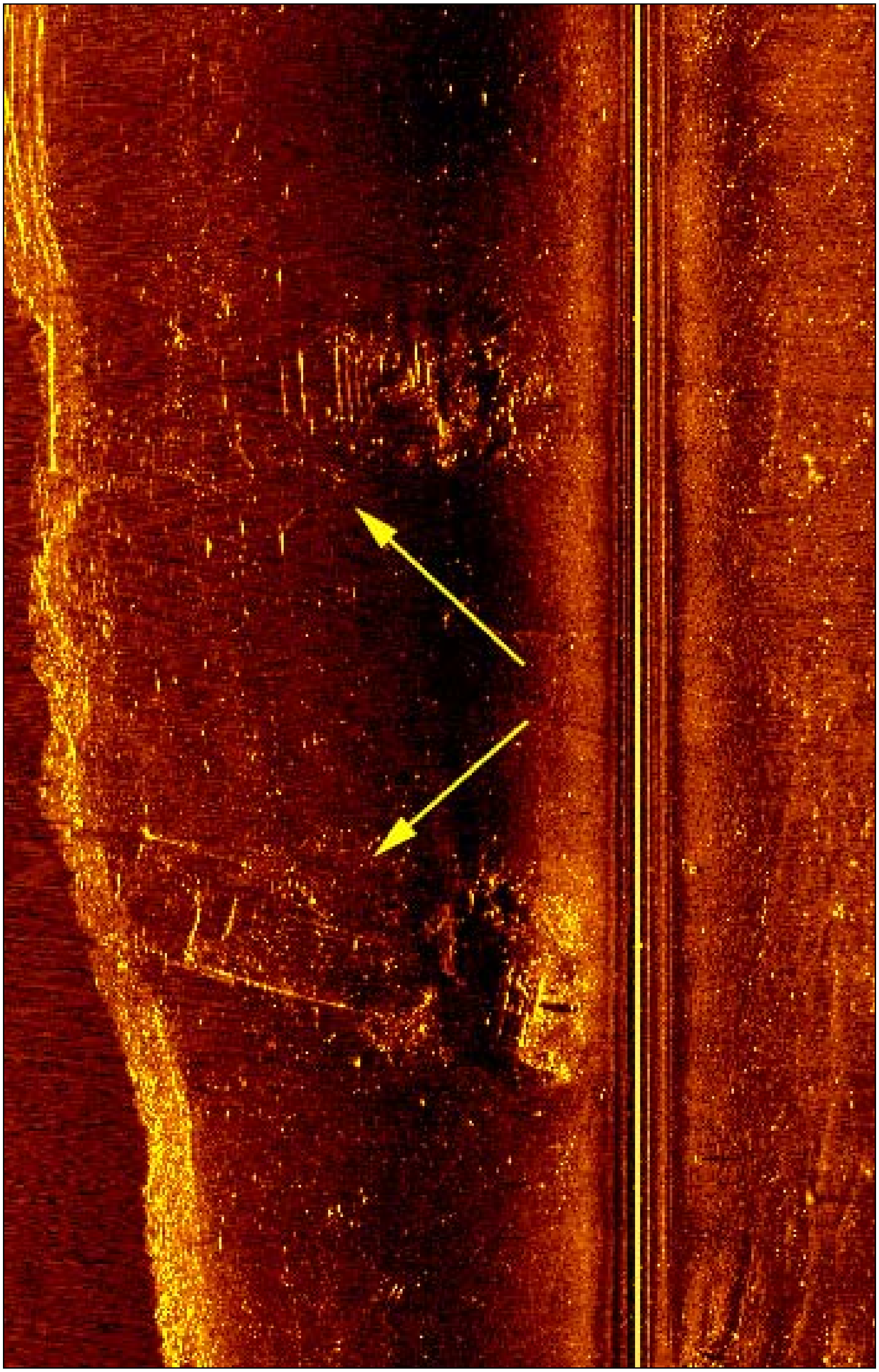


Figure 73. Sonar image of sonar targets SSST-4 (bottom) and SST-5 (top).

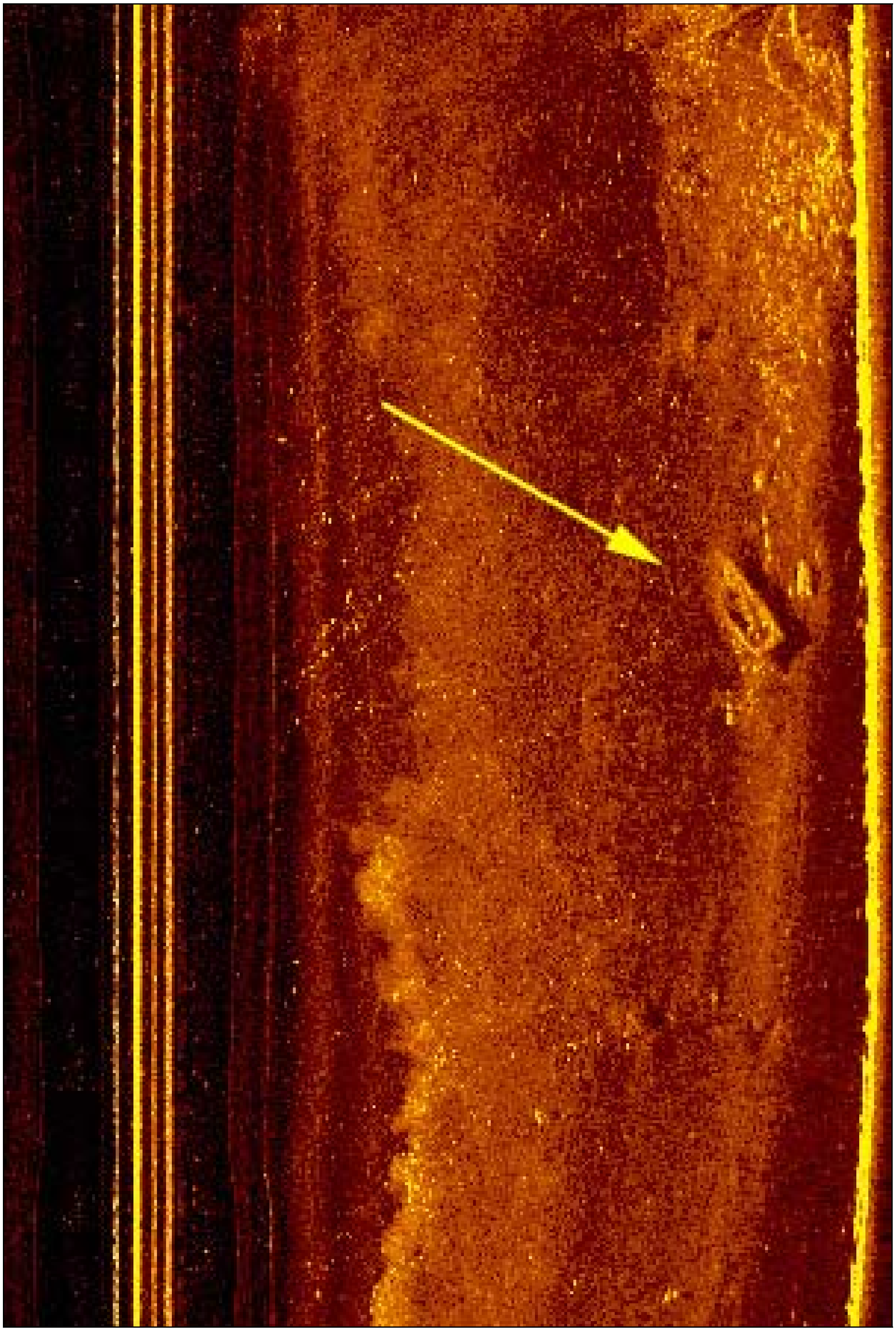


Figure 74. Sonar image of sonar target SSST-6.

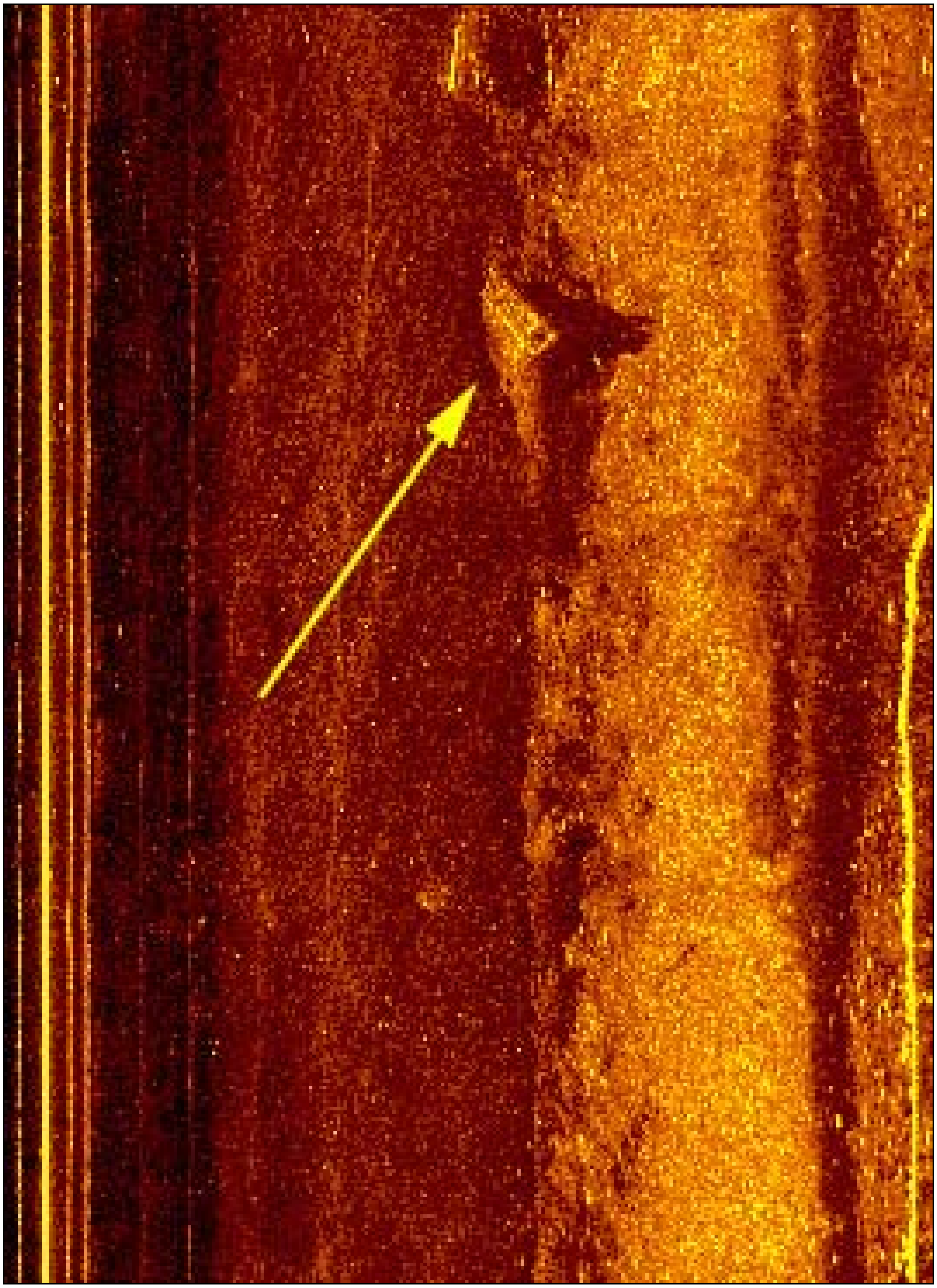


Figure 75. Sonar image of sonar target SSST-7.

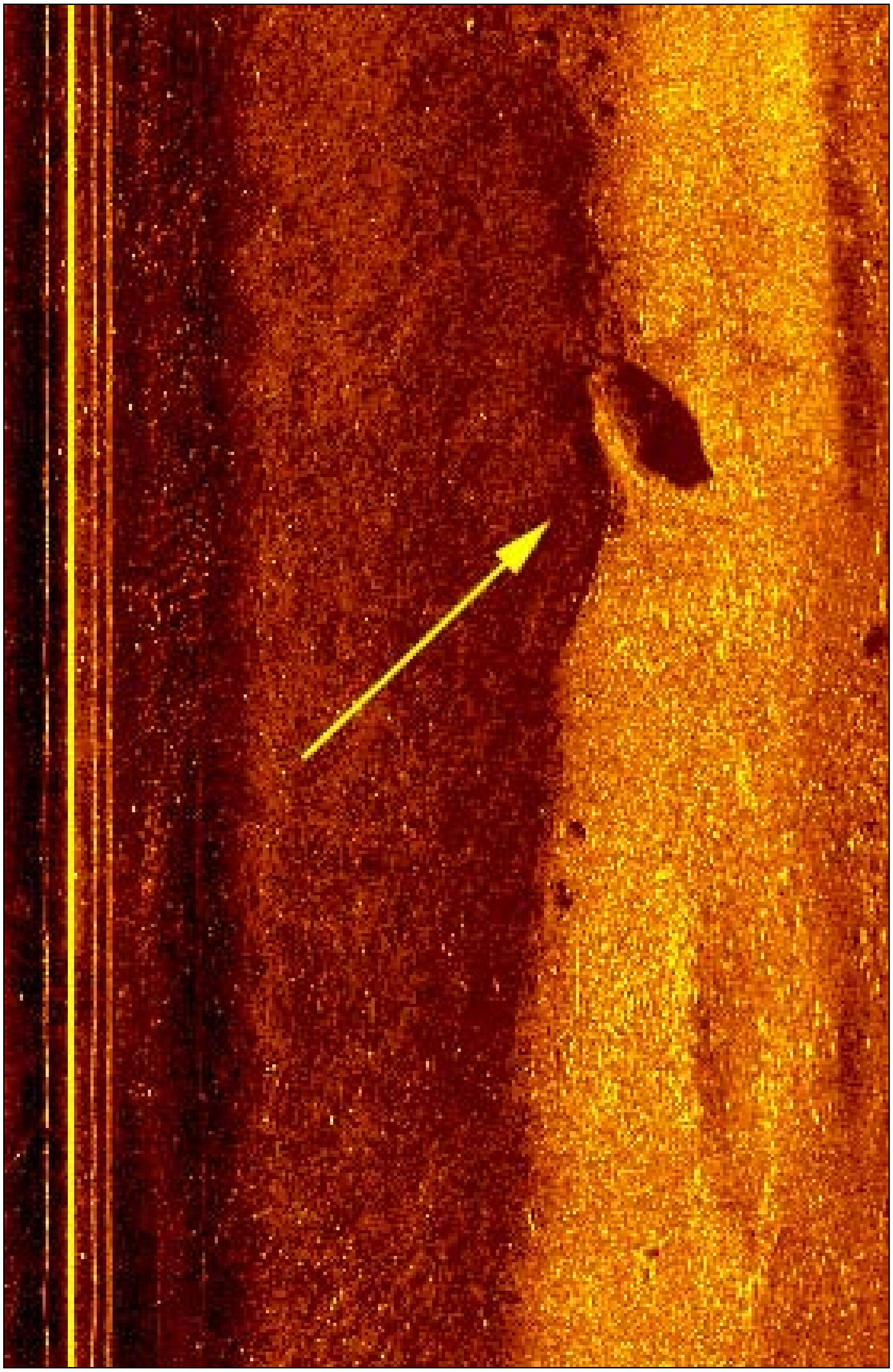


Figure 76. Sonar image of sonar target SSST-8.

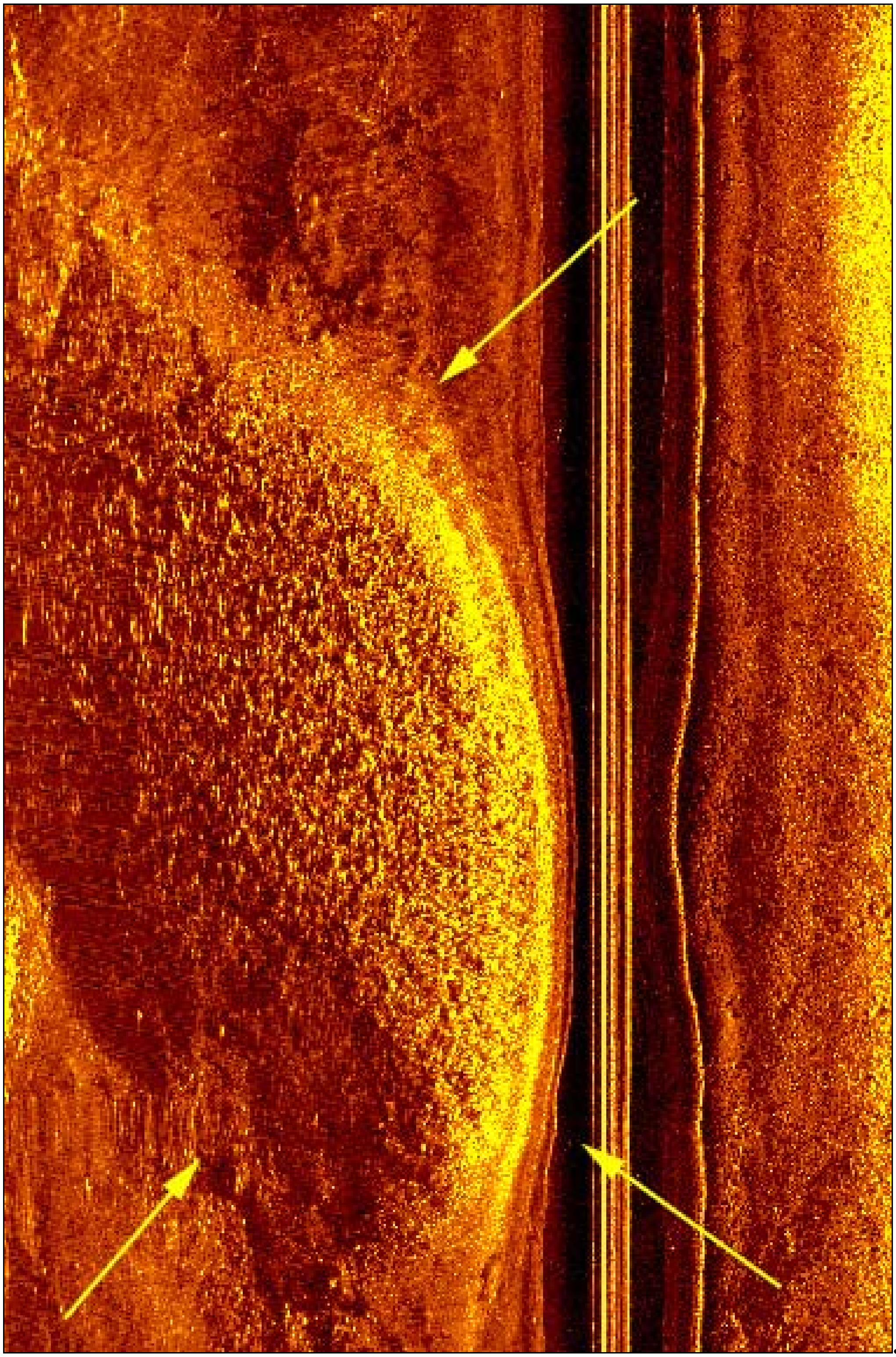


Figure 77. Sonar image of sonar target SSST-9.

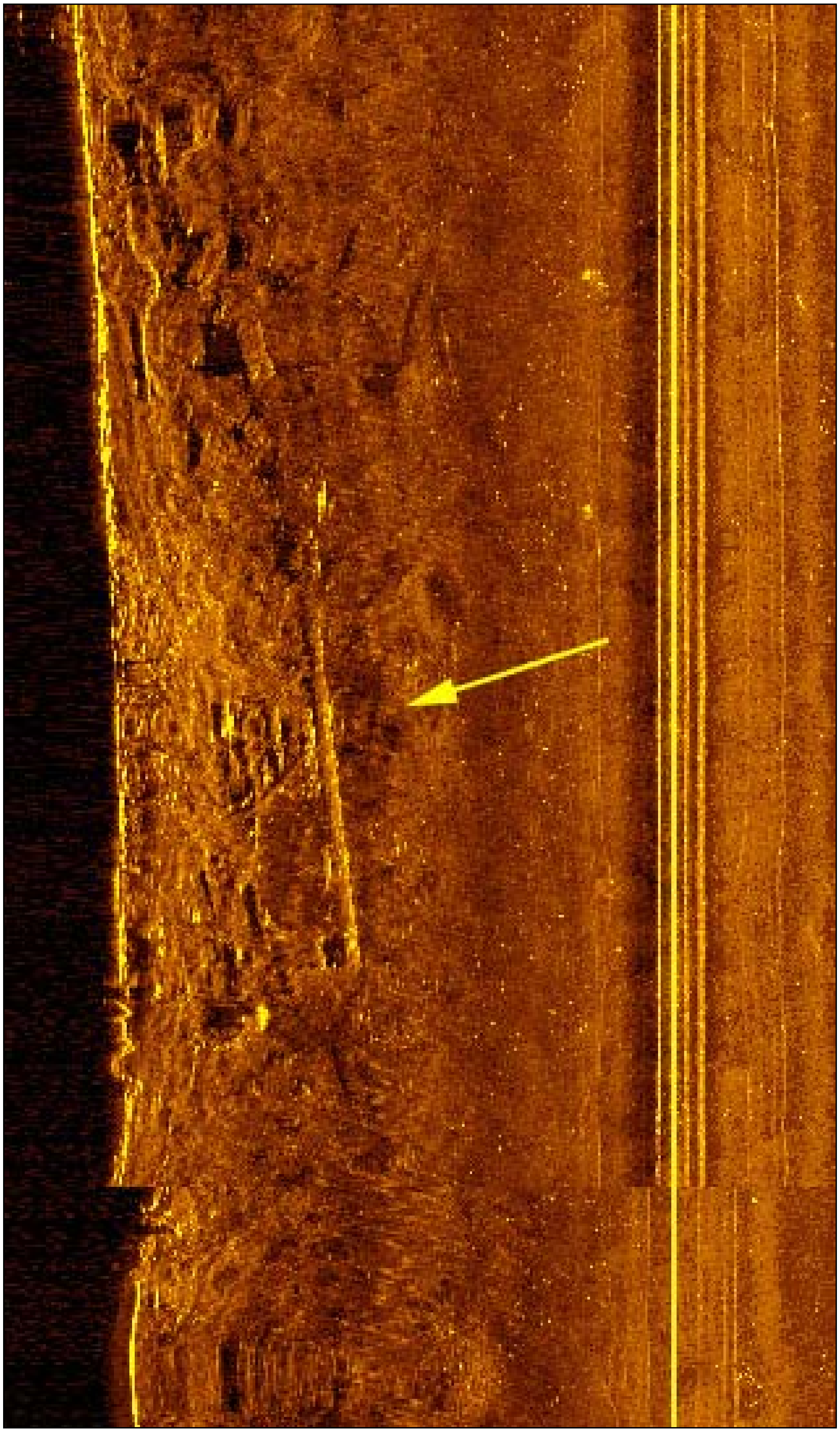


Figure 78. Sonar image of sonar target SSST-10.

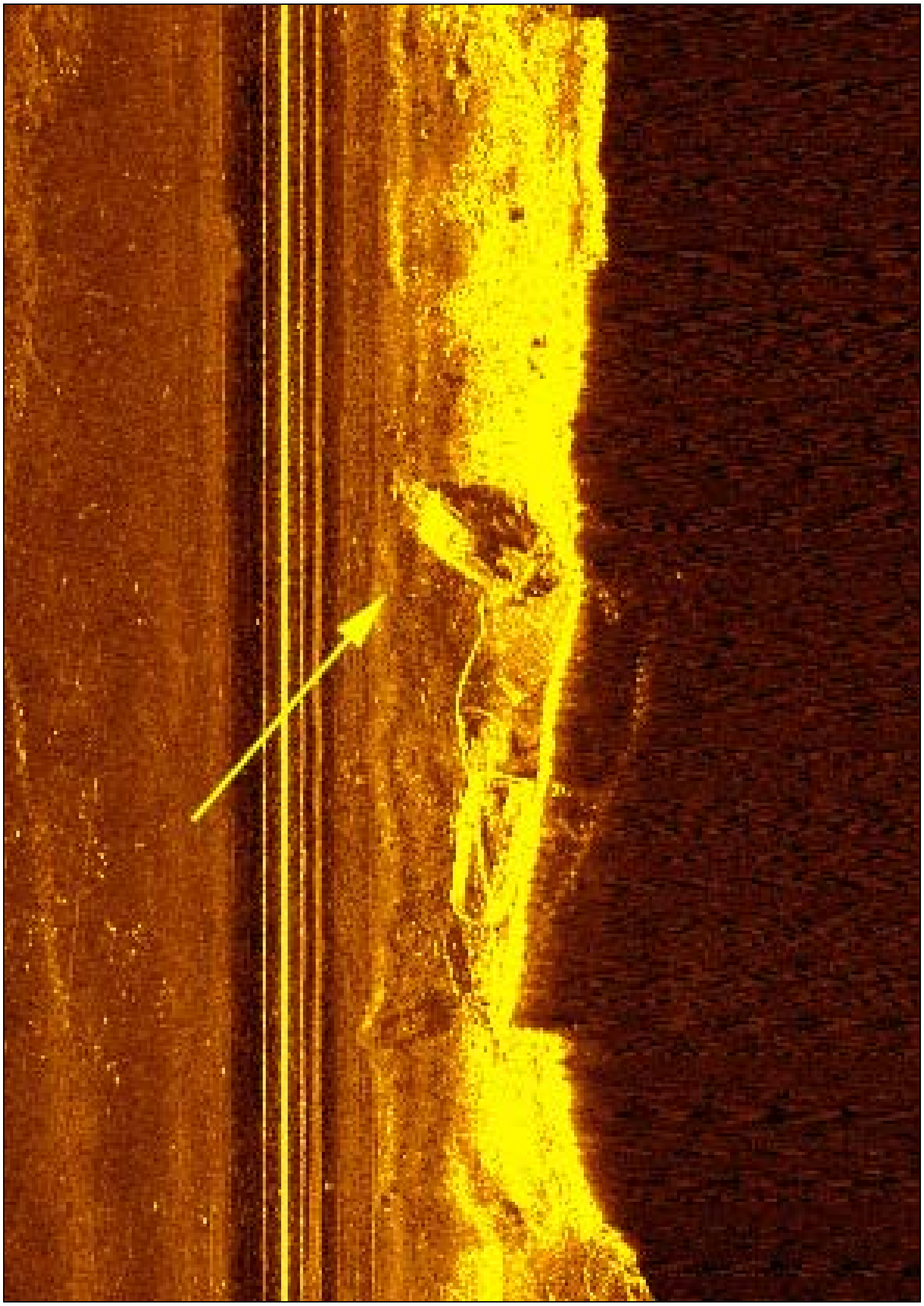


Figure 79. Sonar image of sonar target SSST-11.

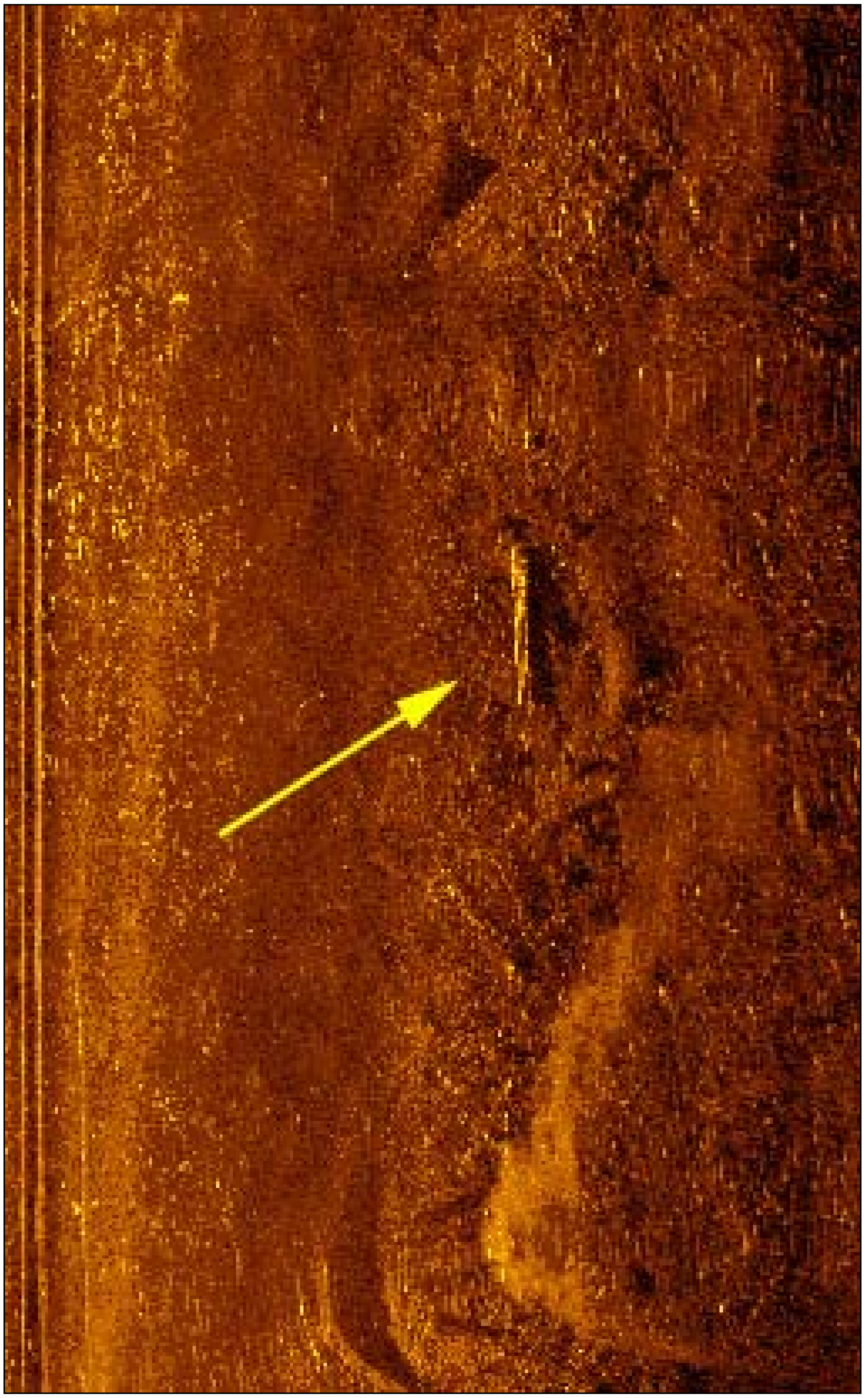


Figure 80. Sonar image of sonar target SSST-12.

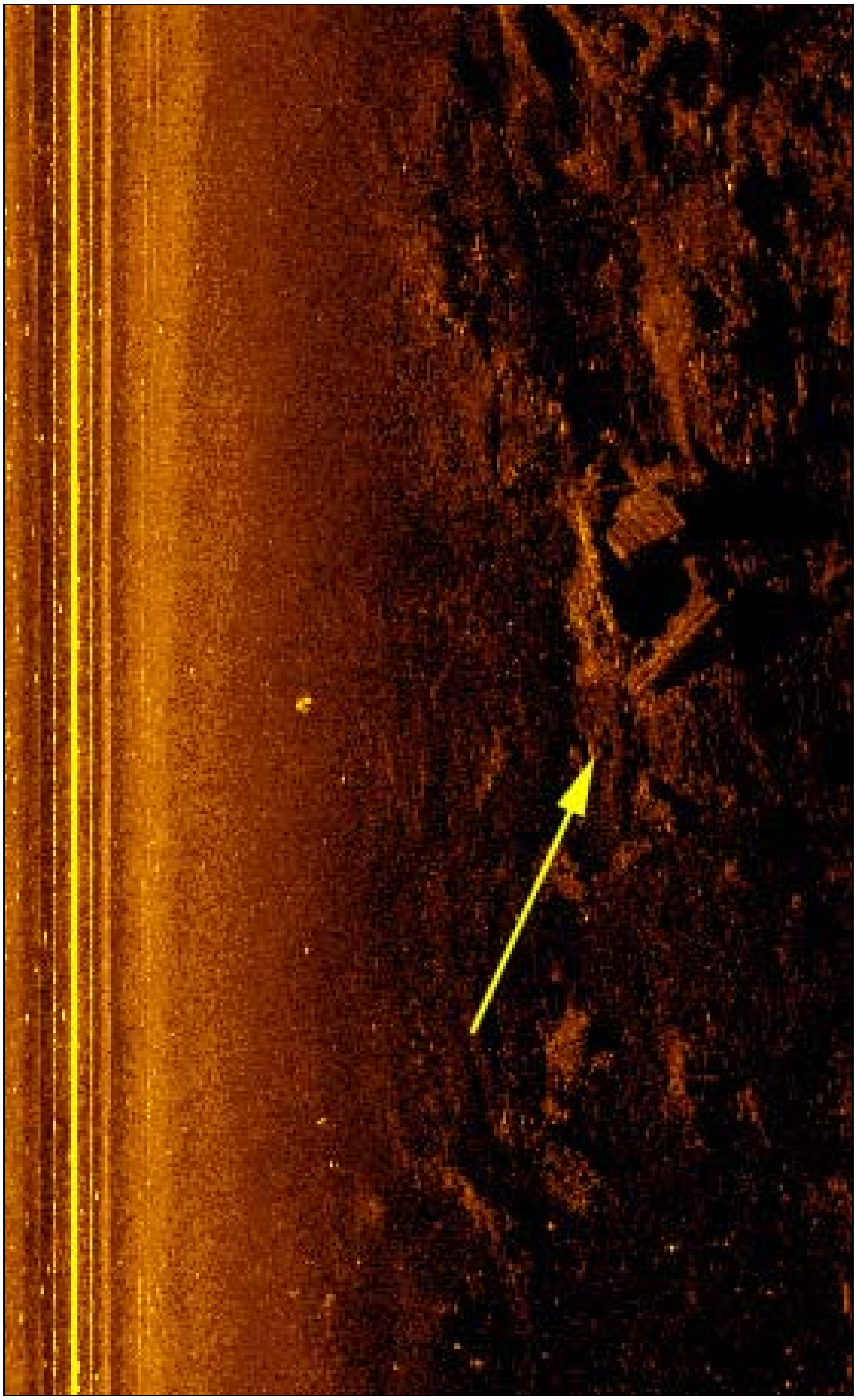


Figure 81. Sonar image of sonar target SSST-13.

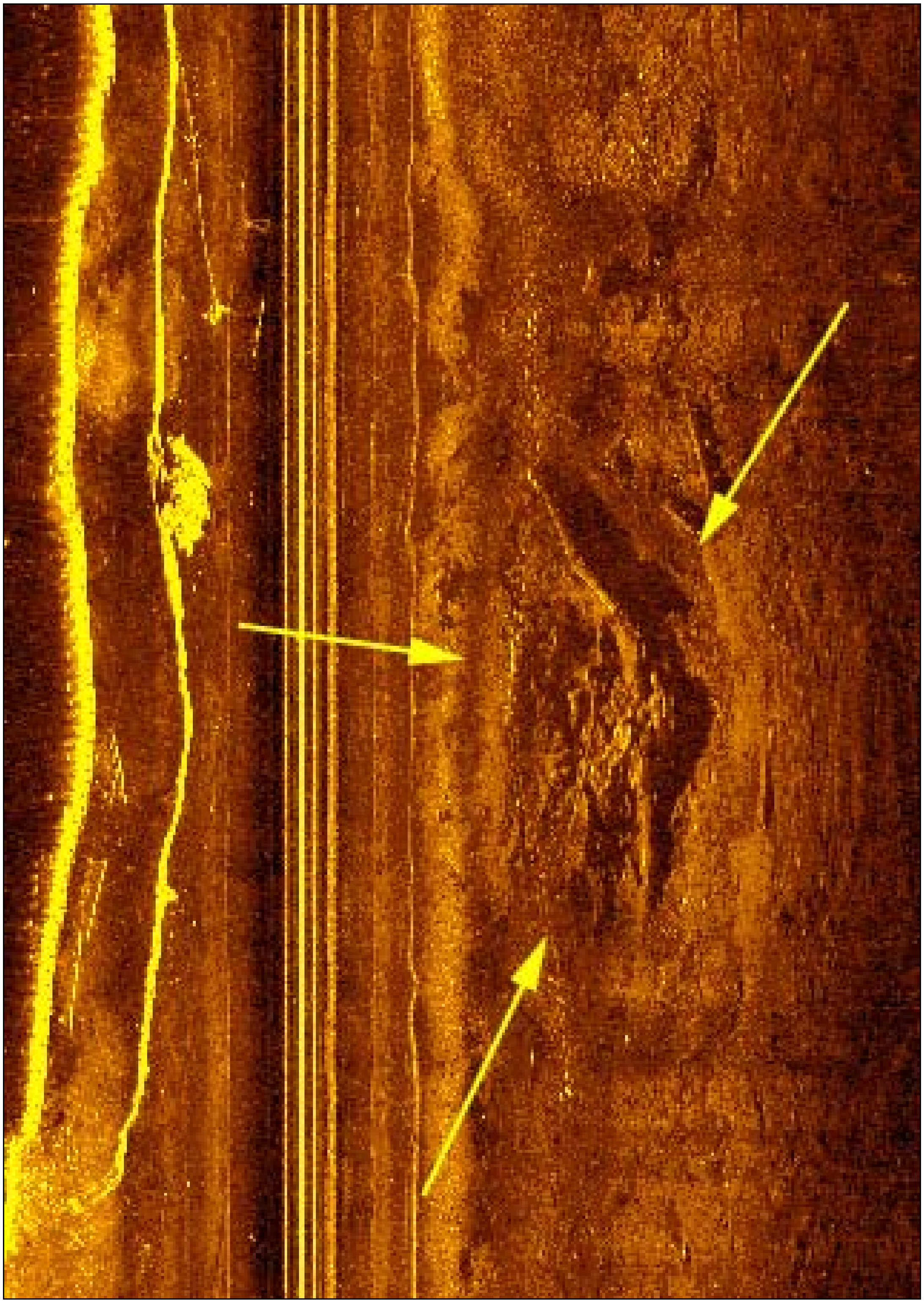


Figure 82. Sonar image of sonar target SSST-14.

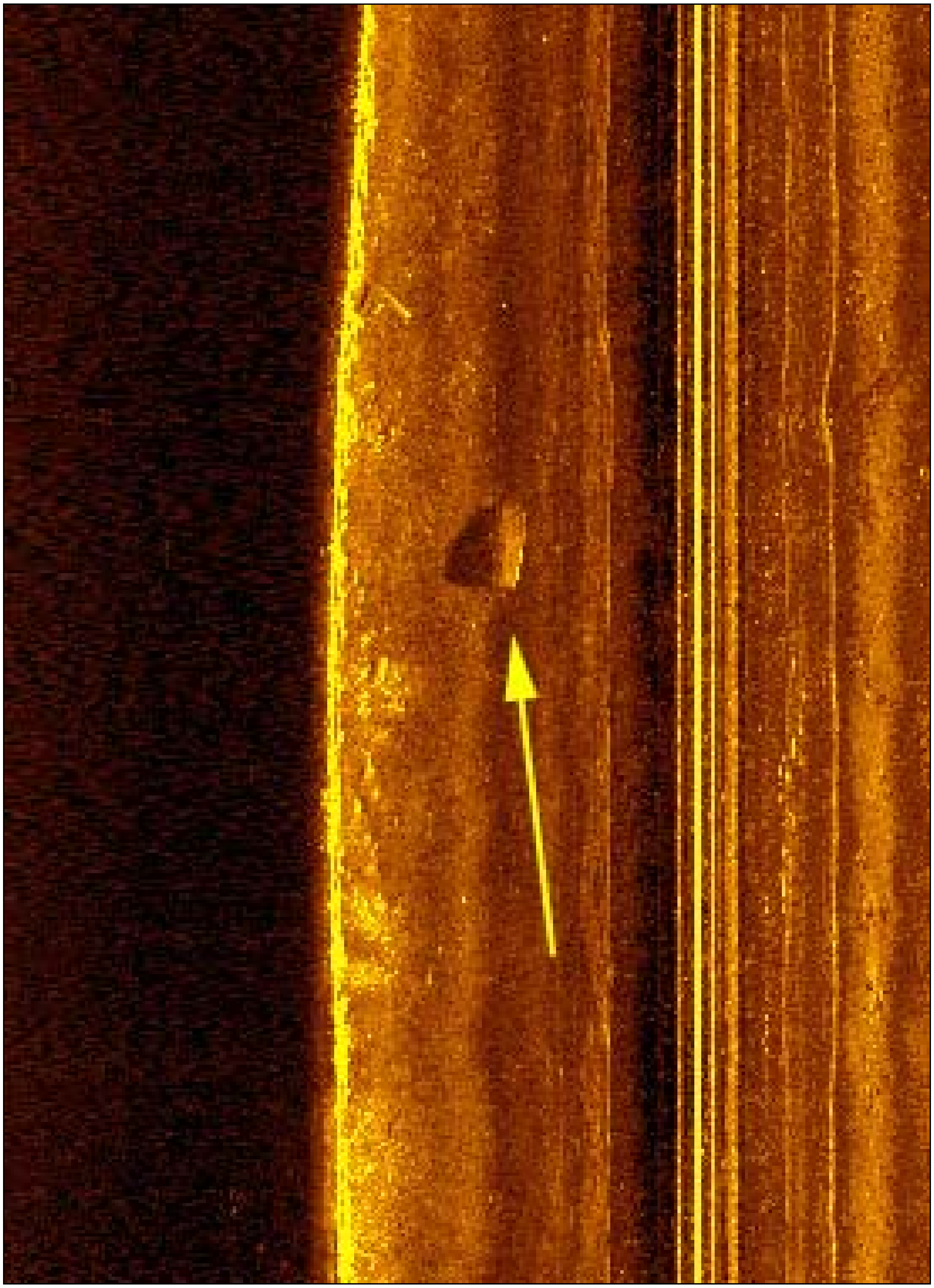


Figure 83. Sonar image of sonar target SSST-15.

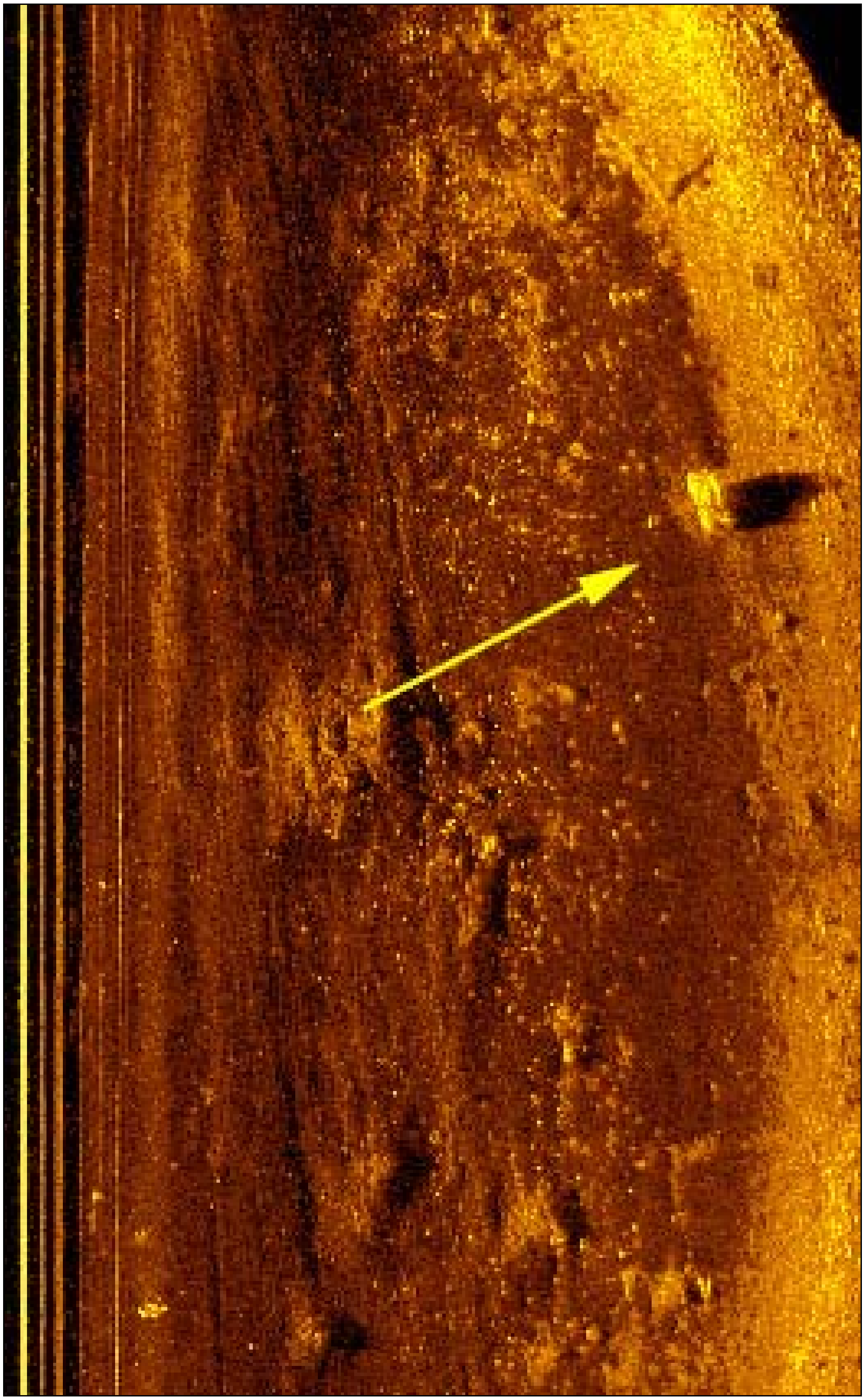


Figure 84. Sonar image of sonar target SSST-16.

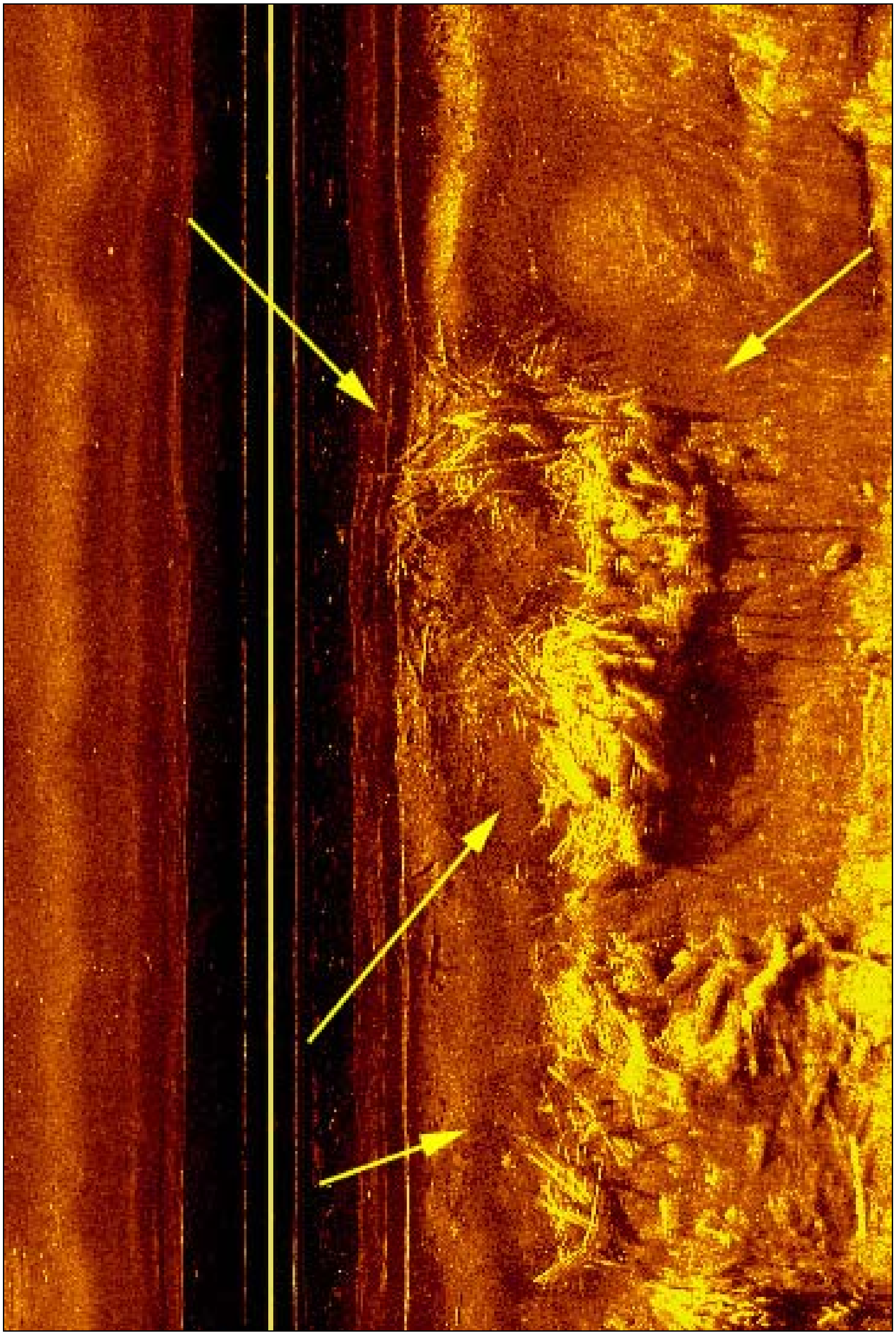


Figure 85. Sonar image of sonar target SSST-17.

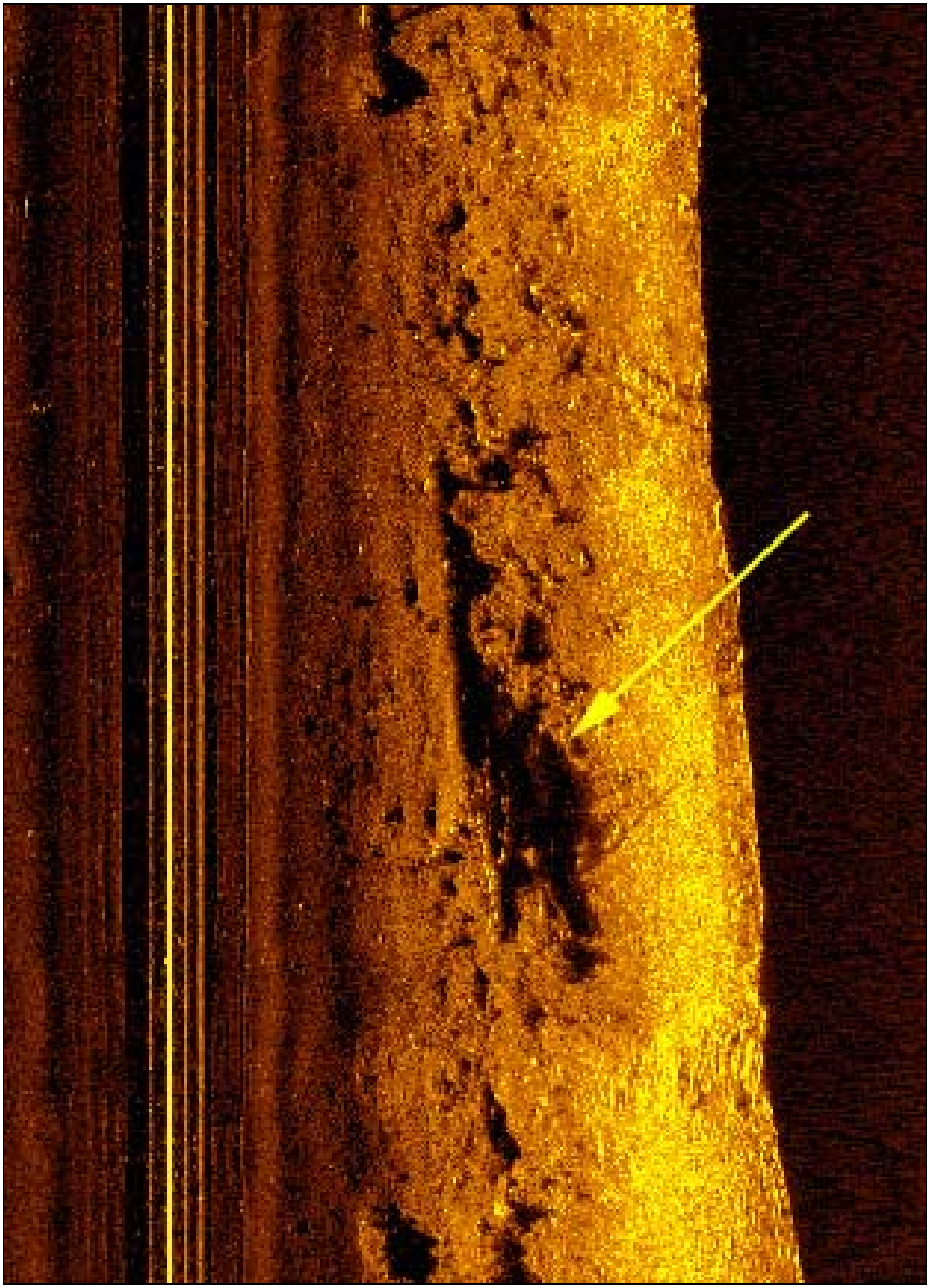


Figure 86. Sonar image of sonar target SSST-18.

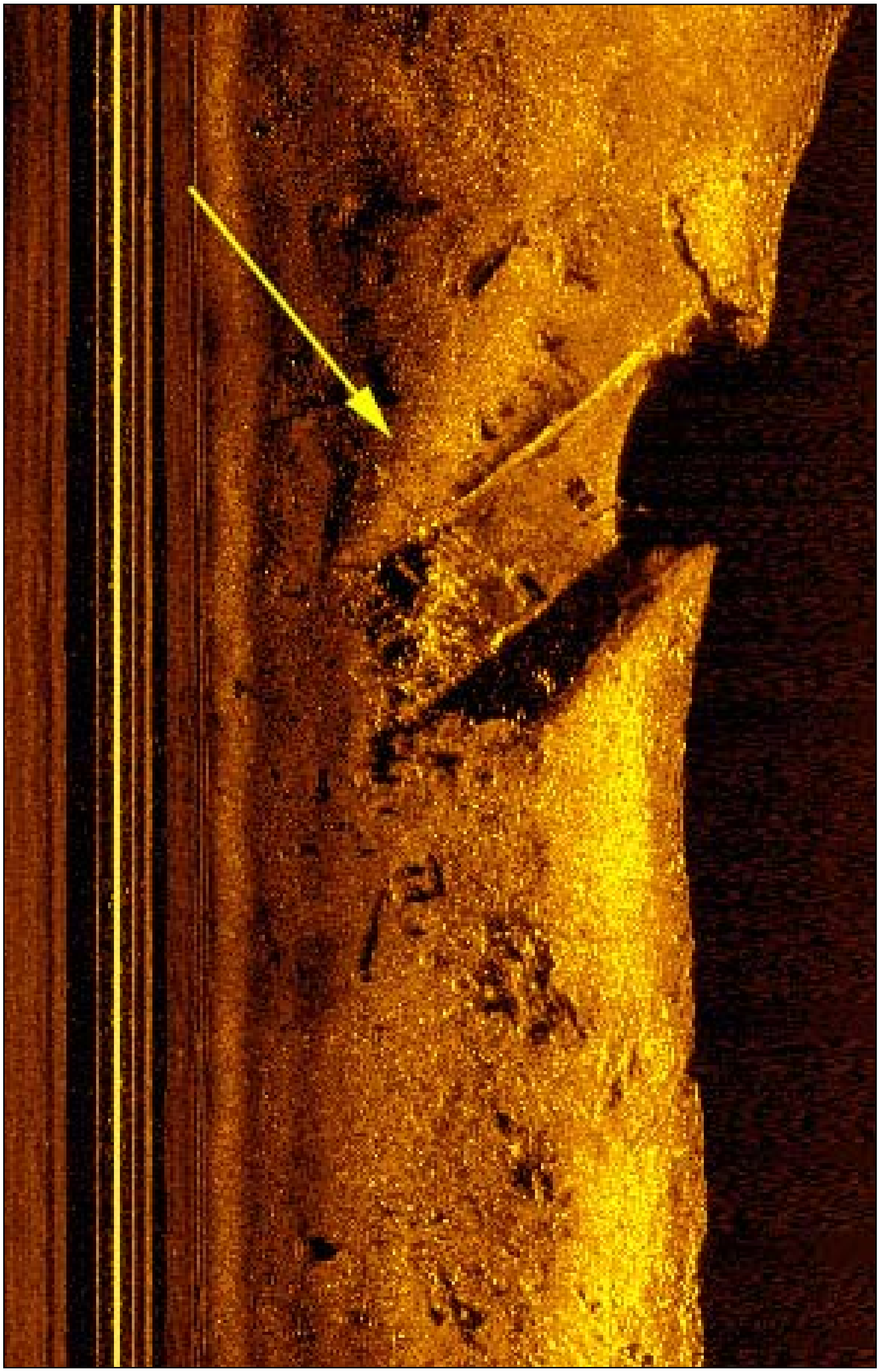


Figure 87. Sonar image of sonar target SSST-19.

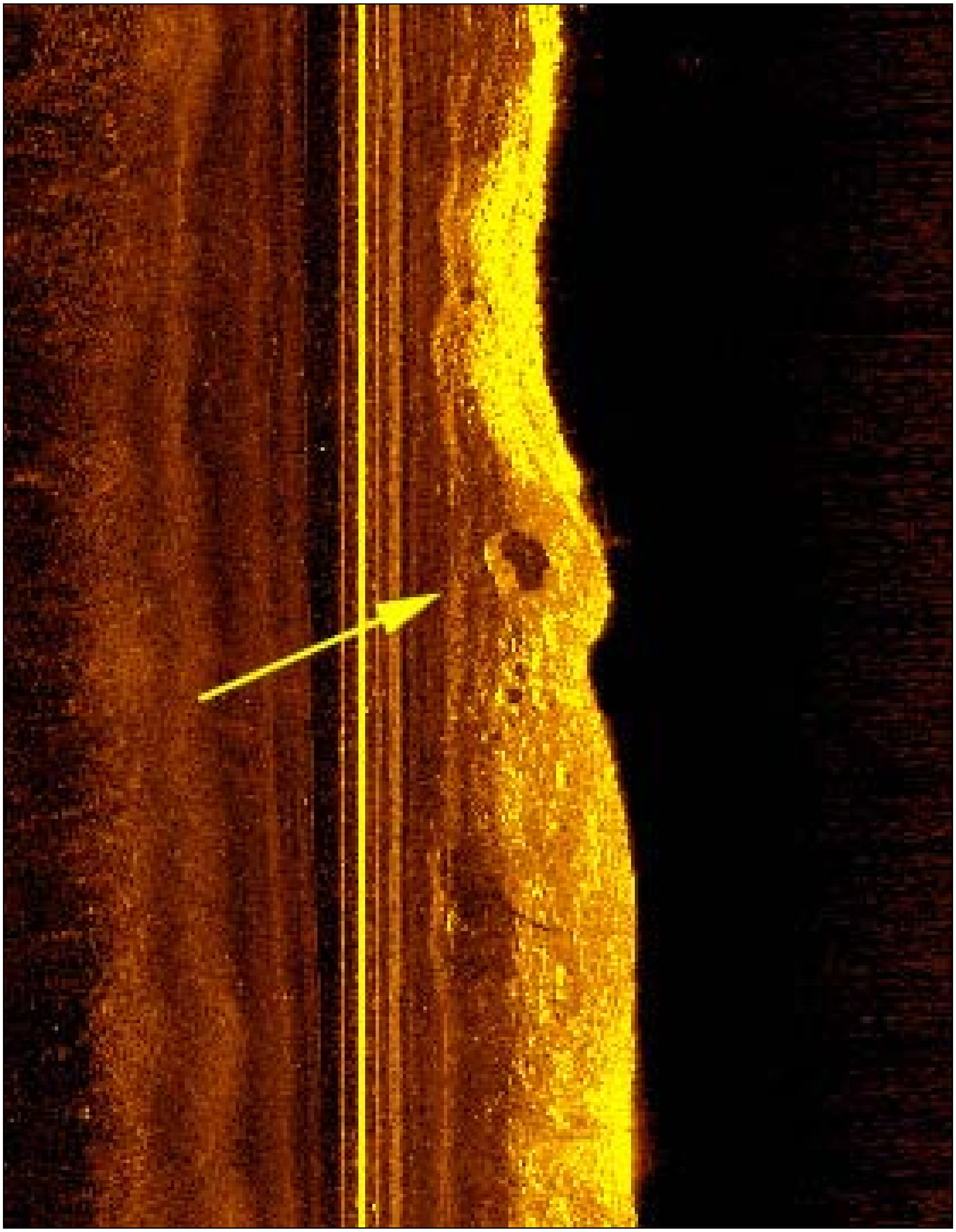


Figure 88. Sonar image of sonar target SSST-20.

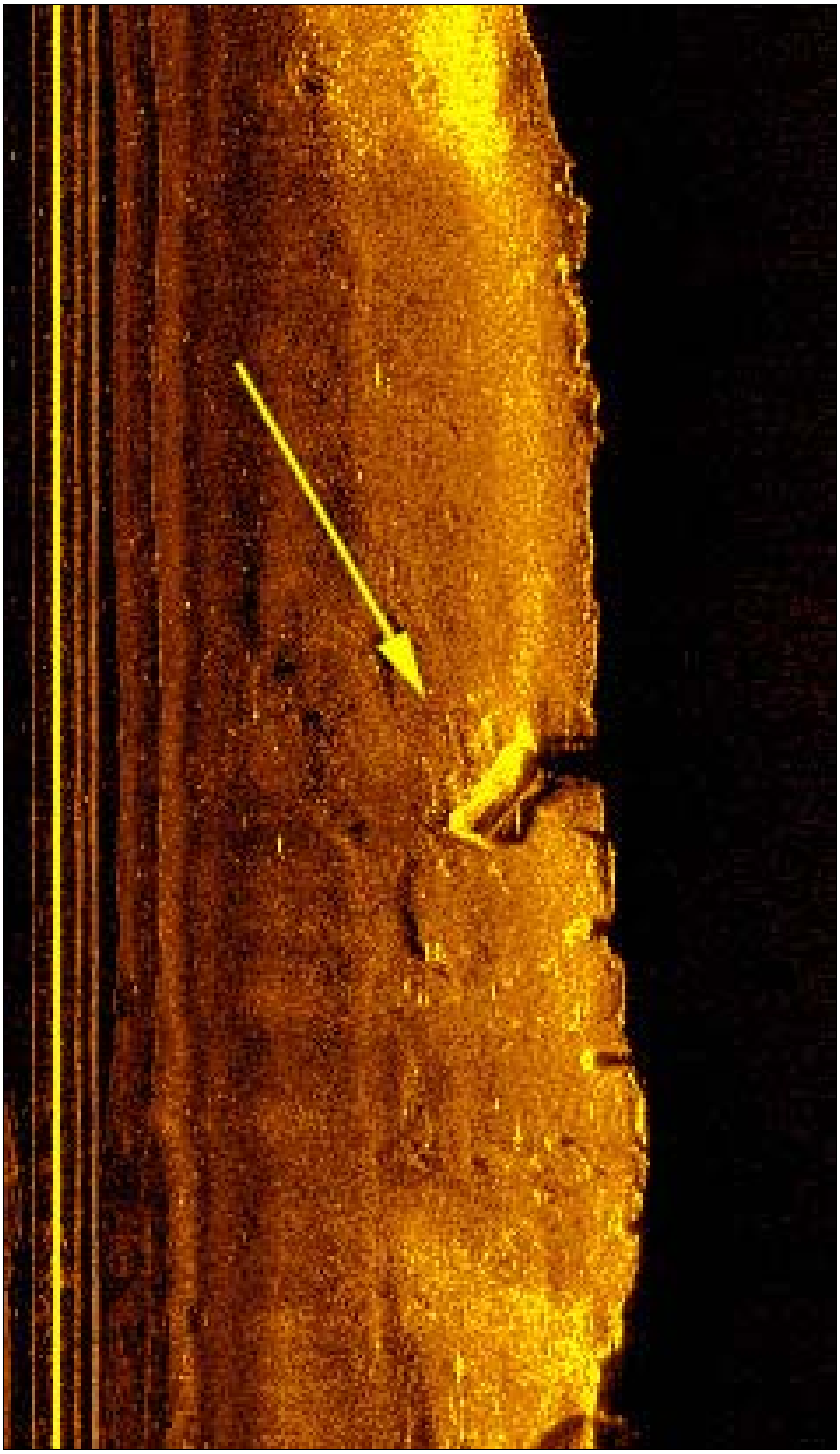


Figure 89. Sonar image of sonar target SSST-21.

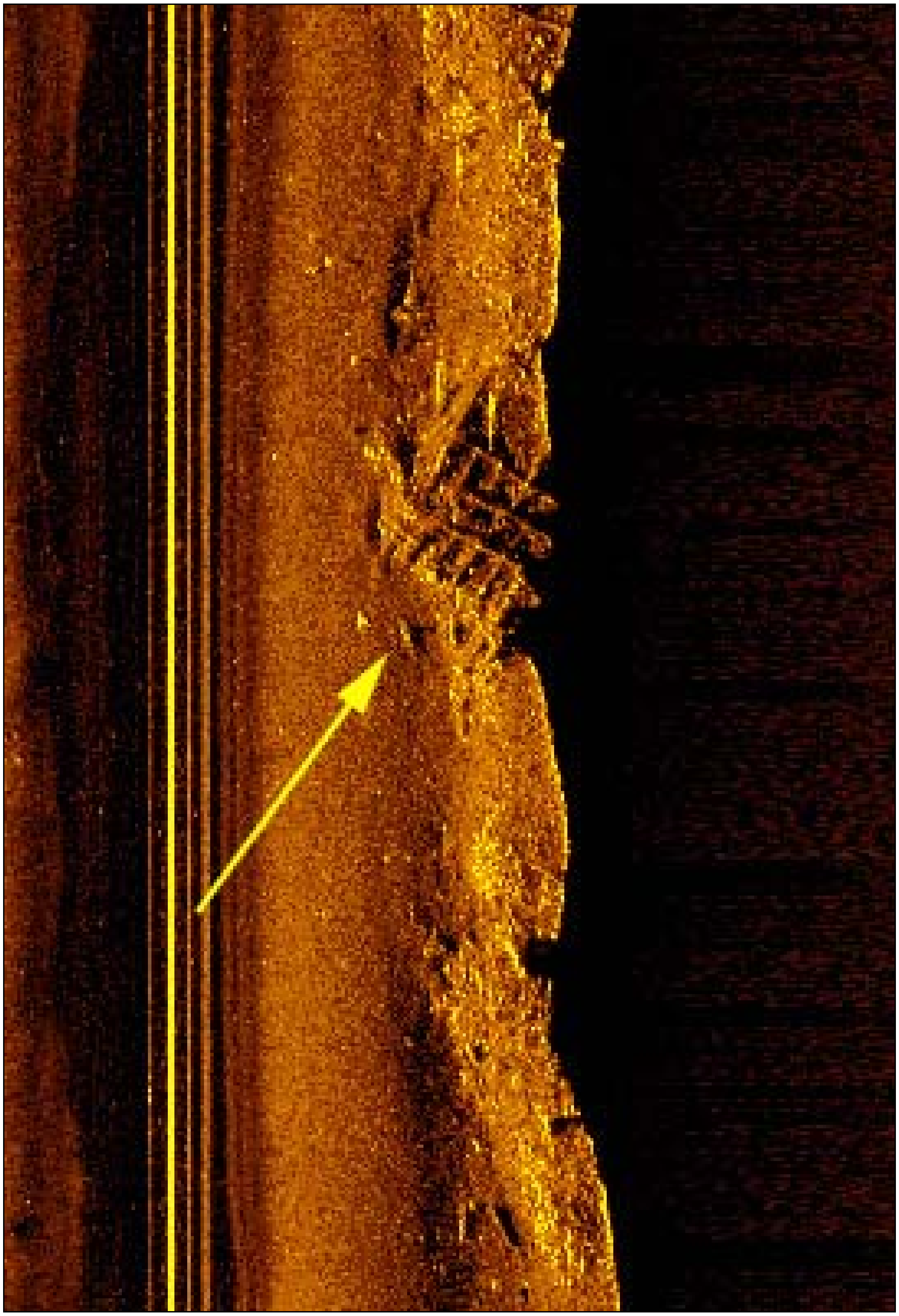


Figure 90.   Sonar image of sonar target SSST-22.

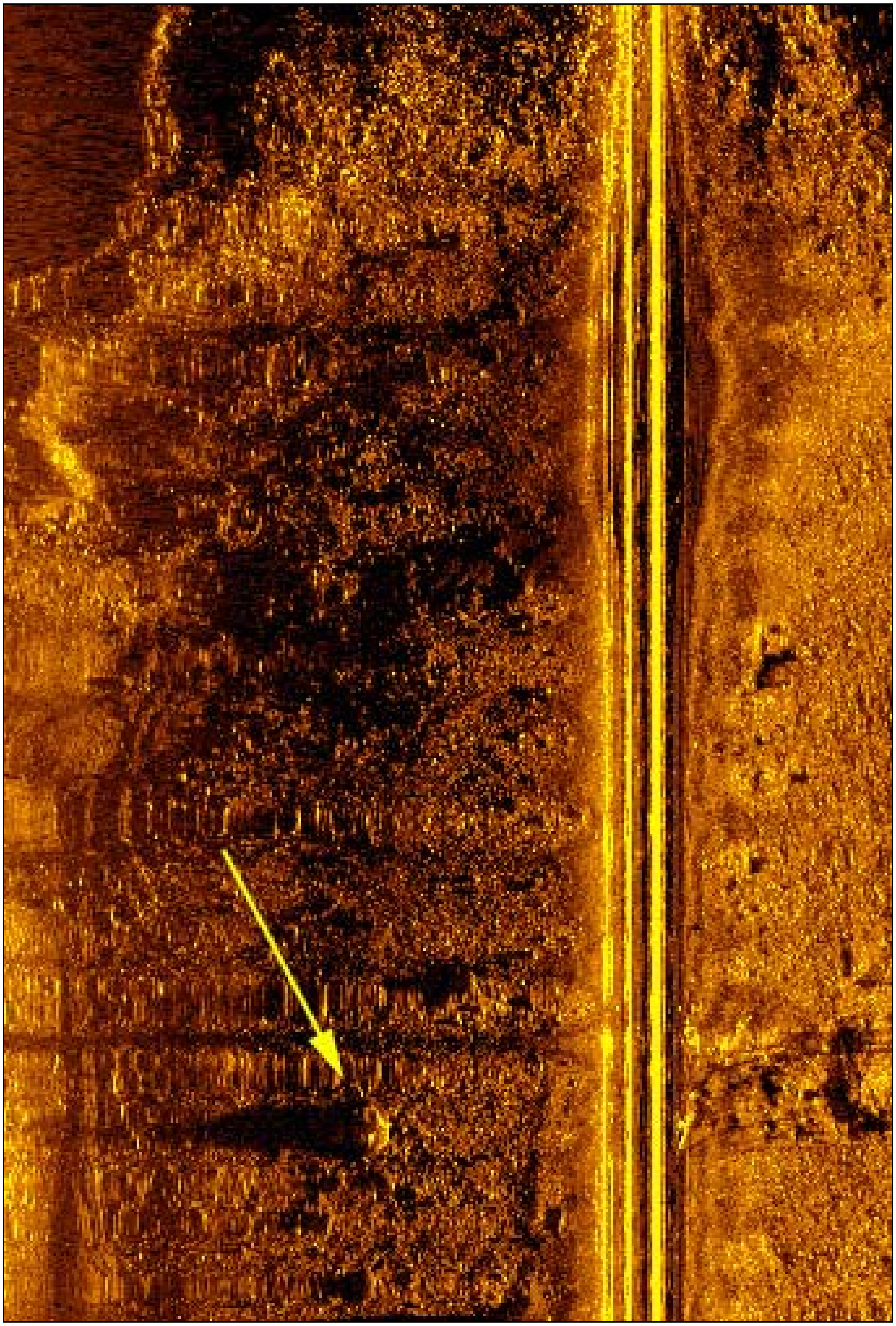


Figure 91. Sonar image of sonar target SSST-23.

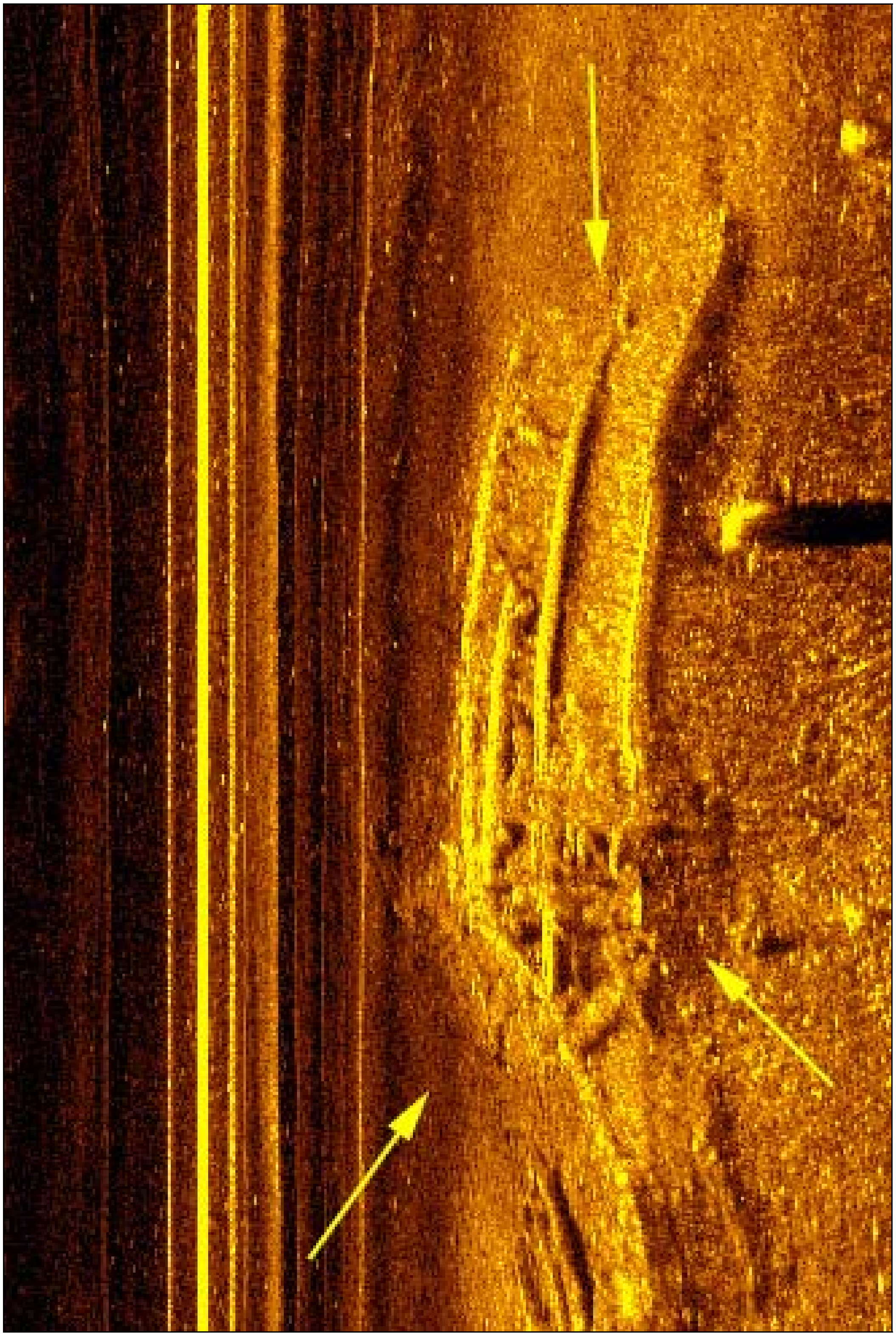


Figure 92. Sonar image of sonar target Wreck.

Figure 93. Photo of sonar target Wreck taken at extreme low tide.

2. Surficial Seabed Classification

Side scan sonar records were reviewed to determine the nature of the surficial sediments. The individual records were processed using Chesapeake Technologies SonarWebPro software to produce fully geo-referenced sonar mosaics (Figure 94). The individual records were also processed using Quester Tangent's QTC SIDEVIEW and QTC CLAMS.

An unsupervised classification technique, which forms the data into logical clusters that can then be identified based on ground truth, was used to segment and classify the sonar imagery. Raw side scan sonar imagery were processed using QTC SIDEVIEW software produced by Quester Tangent. Batch processing techniques read the data on a line by line basis and extracted meaningful features by using a series of algorithms influenced by image texture. Principal components analysis (PCA) was employed to reduce the quantity of the features without a significant reduction to the information content. Objective, automated clustering was used to define portions of the image exhibiting similar backscatter texture and intensity. The results of PCA and clustering were captured in a catalogue of bottom types. The catalogue was used to classify all the data. Approximately 155,000 classification records were generated. A total of nine acoustic classes were identified.

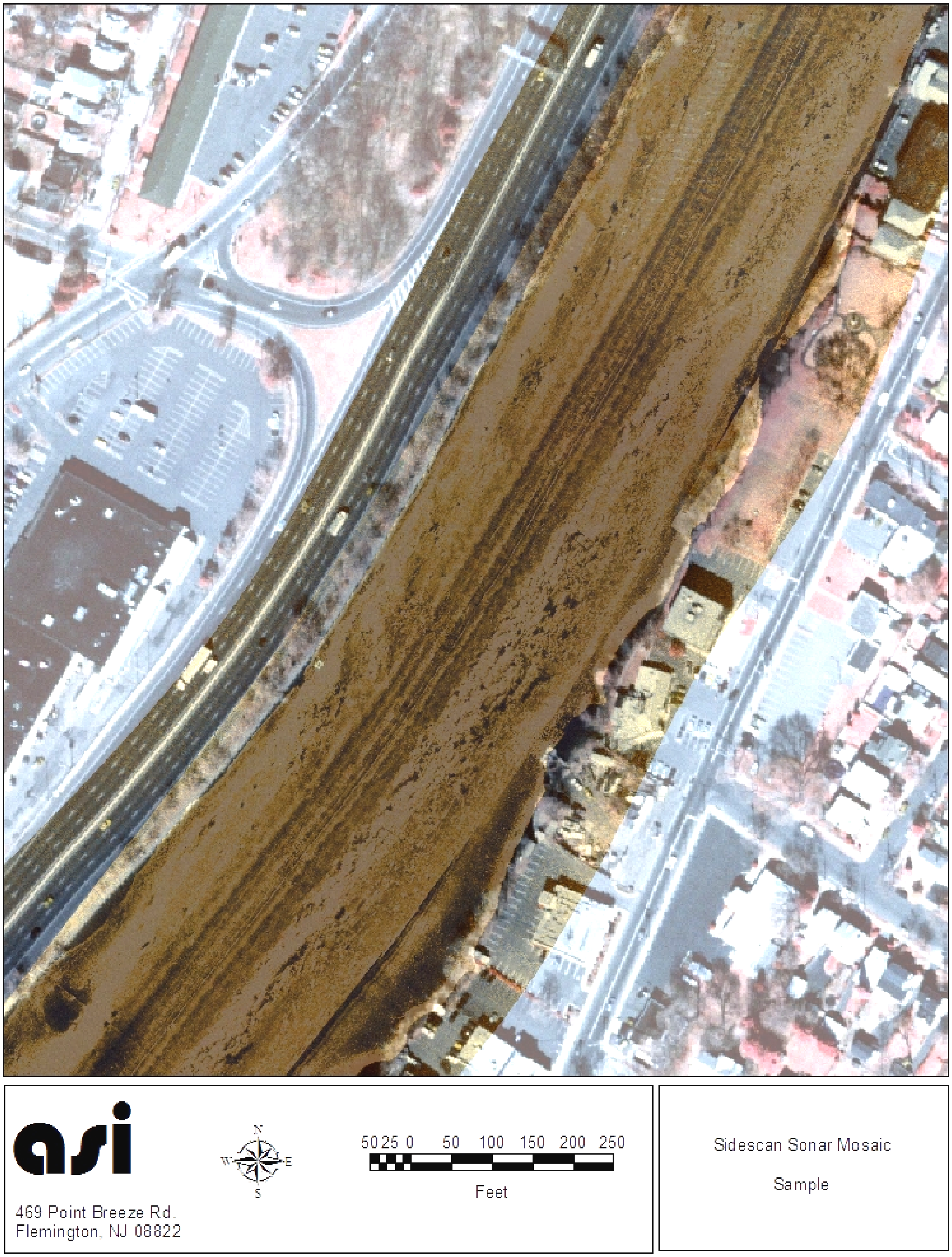


Figure 94. Sample image of side scan sonar mosaic from the GIS.

To utilize side scan sonar technology for seabed classification, software that extracts information not from the details of the vertical echo over time but from the amplitudes and variability of backscatter is required. The package used was QTC SIDEVIEW™. Backscatter changes dramatically as the sonar angle changes and it is essential to compensate the image for this accurately. QTC SIDEVIEW implements a patented process in order to properly compensate the backscatter imagery.

It is well known that the statistical characteristics of a sonar backscatter image depend on the bottom type. Even to a novice user, the texture differences between images of rocks, sand, and mud are readily apparent. Differences between silt and clay are less obvious. Statistical processing can capture many of the pertinent details of the interaction between the sound and the bottom and of its vertical relief. Multivariate statistics can then isolate those details that are rich in information about the bottom, producing features that contain the information necessary for accurate and reliable bottom classifications.

Classification of the bottom is done by an automated clustering method that adapts to the characteristics of the side scan data set. Each cluster represents a bottom type, which can be identified based on ground truth; for example, photographs, grain-size analysis, or other local data. If the bottom type is known before classification, data from the areas of known sediment type can be used to build a catalogue, which would then be used to classify subsequent or archived data. This is called supervised classification. The effectiveness of unsupervised classification in uncovering practical and valuable information from the acoustic data has been demonstrated in many projects. This clustering technology, with its classification options, forms part of QTC SIDEVIEW.

Sediment classification can be done visually, mechanically, and acoustically. All visual methods (divers, video, and photography) and mechanical methods (divers, grab samples, cores, and probes) are slow and manually intensive, thus expensive and not suited to extensive survey work. Acoustic methods, however, can cover large areas quickly as there is no need to stop the survey vessel. However, sediment classification using acoustics alone is possible only in specific and unusual situations. The power of acoustic bottom classification is the ability to apply visual or mechanical classifications over much larger areas than point data alone would allow; that is, the sediment properties obtained from the point samples can be applied with confidence over entire regions that have been mapped acoustically.

Image-based bottom classification is the segmentation of bottom sediments into discrete classes based on the characteristics of acoustic backscatter throughout a region. Segmentation is a valid and useful survey tool, even though it does not independently identify geophysical types. Dividing the bottom into classes is useful because sediment characteristics are relatively constant throughout a class and distinct from the characteristics of other classes. Therefore, the amount of ground truth that needs to be collected, visually or mechanically, is dramatically reduced. A small number of samples from each class are adequate to define the entire class. Also, if sampling locations are chosen away from class borders the samples would be known to represent a single class, not a mixture of classes. This further reduces the number of samples that have to be processed.

Careful quality control is an essential part of reliable and accurate bottom classification. With echo-sounder data, for example, the bottom picks must be accurate so that only bottom echoes are compared, not reflections from fish or artifacts. For side scan sonar data, quality backscatter imagery is necessary for accurate classification. Problems can occur however. For example, images can be smeared by excessive vessel or tow fish motion. Thus, an important processing step is display and validation, followed by filtering images to remove regions that do not meet acceptable standards.

A mask is used to exclude regions of poor quality from further processing. Data are not removed, just flagged for exclusion from subsequent processing. Important changes in sonar operating conditions are taken into consideration in this step.

Following loading the data from the Lower Passaic River survey, the tow fish altitude was digitized as this information was not provided in the raw file. During digitization, the data set was also assessed for quality. Areas that did not appear to accurately represent the bottom were masked out using QTC SIDEVIEW's manual editing tools. These areas included shoreline regions, areas of excessive motion, and man made objects present on the river bottom. All the data were then cleaned using batch processing. The water column plus a 1 meter offset were masked in all of the images. This water column offset was increased to 4 meters in the data from the uppermost river area above the 8th St Bridge in Wallington, NJ (river mile 15.3) to mask excessive motion in the towfish caused by swift currents and shallow water. Also, the data beyond a range of 45 meters were masked due to the potential for poorer quality data at long range (Figure 95).

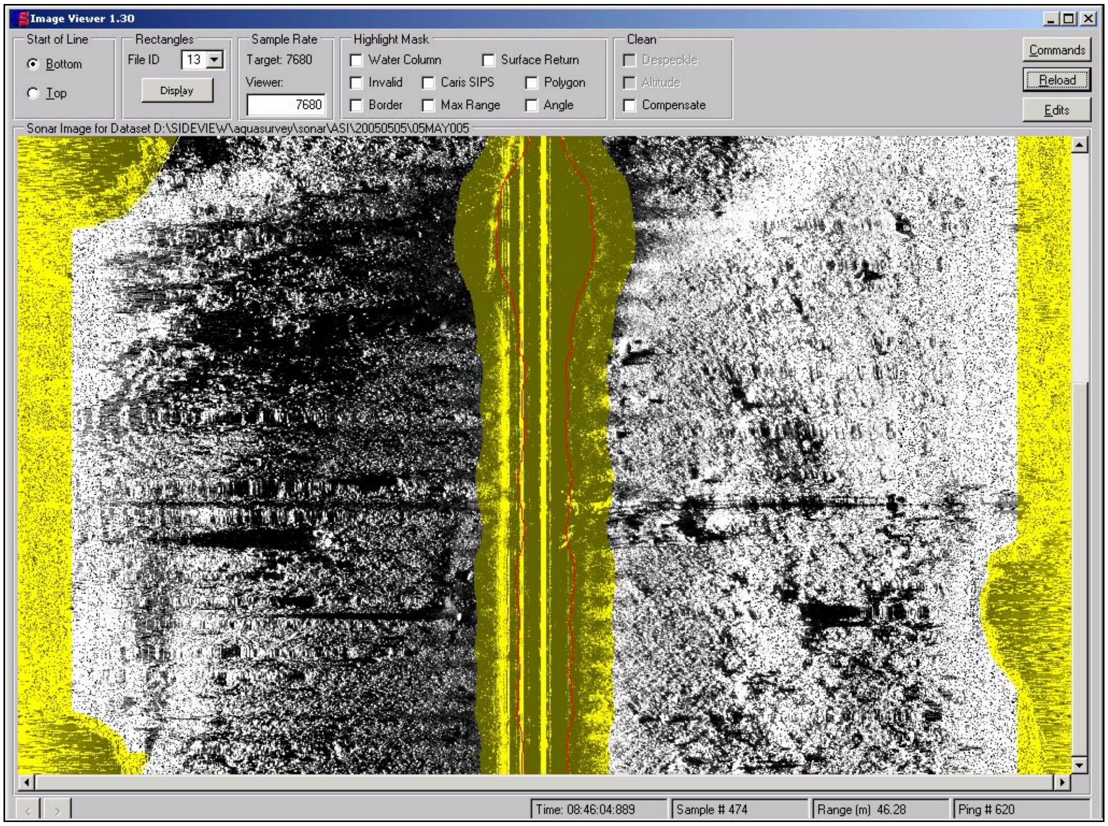


Figure 95. Motion artifacts near Nadir on an uncompensated image. Transparent yellow areas indicate masked regions. This image is from line 05MAY005.mst.

The bottom in the image was divided into rectangular patches. Through use of the mask, areas of low quality are omitted when patches are placed. For some systems, placement is influenced by insonification and sonar angles with constraints that depend on the type of the sonar system. These constraints and the user-selected patch sizing determine the number of patches per side (to port and to starboard). Changing the patch size and reprocessing the data provides for an optimization of the result for a particular scale of feature or boundary resolution. A class assignment is generated for each patch.

For the Lower Passaic River data, a rectangle size of 65 (across track) by 33 (along track) pixels was chosen. This approximates a footprint of 6 meters by 6 meters on the bottom. Figure 96 shows an example of a backscatter image with rectangles on it. Each rectangle will become a final classification point. Rectangles were only placed on areas of the image that were not masked.

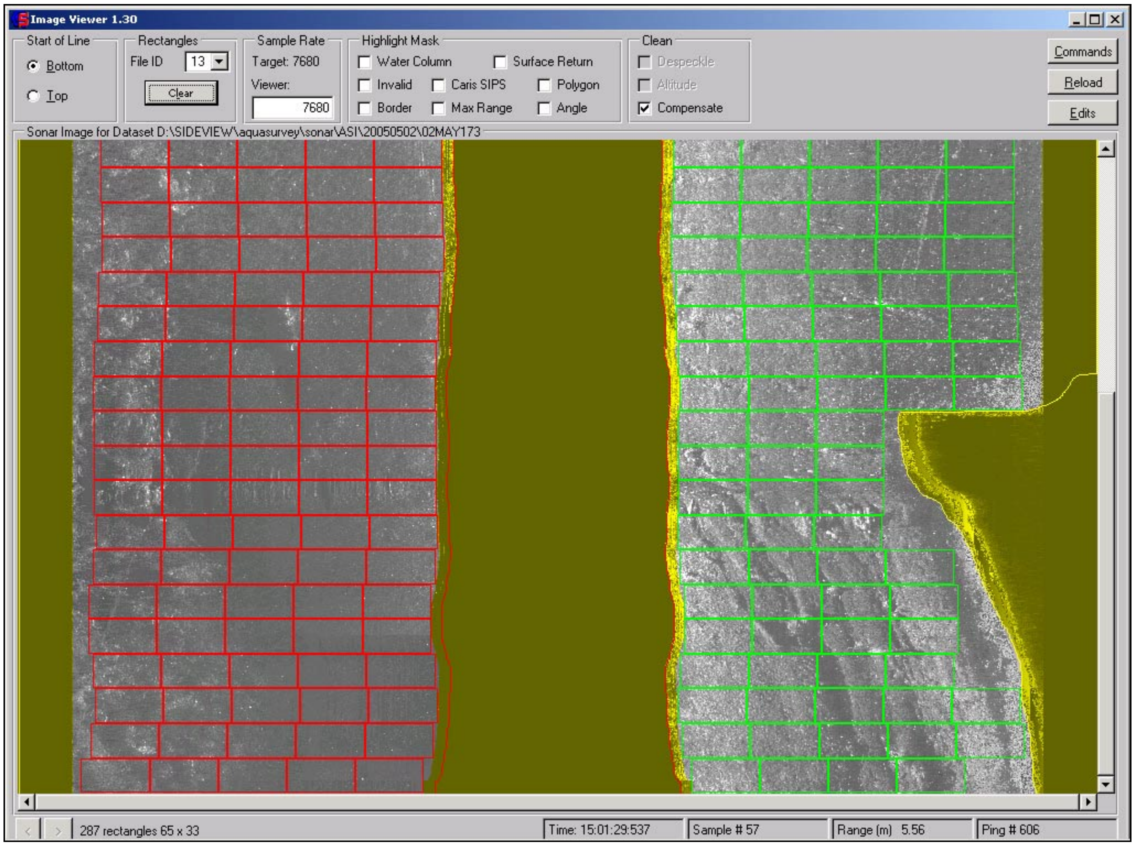


Figure 96. High quality compensated backscatter image with rectangles. Transparent yellow areas indicate masked regions. This image is from file 02may173.mst.

After the rectangles were created, the backscatter data from within each rectangle were run through the feature algorithms. The compensation process was performed at this stage. Figures 96 and 97 show the compensated and uncompensated images. Each point is now referred to as a Full Feature Vector (FFV). A second level of quality control was performed. Several individual FFVs were rejected due to erroneous position or heading typically found during sharp turns or just after emerging from under a bridge. Also, points with altitudes less than one meter were filtered. Rejected and filtered points were not carried forward for further processing by the software.

A large number of features are extracted from the backscatter amplitudes in each rectangular patch of each image. QTC SIDEVIEW is able to use many features because Principal Components Analysis, in the next processing step, will select those combinations of features best suited to each data set.

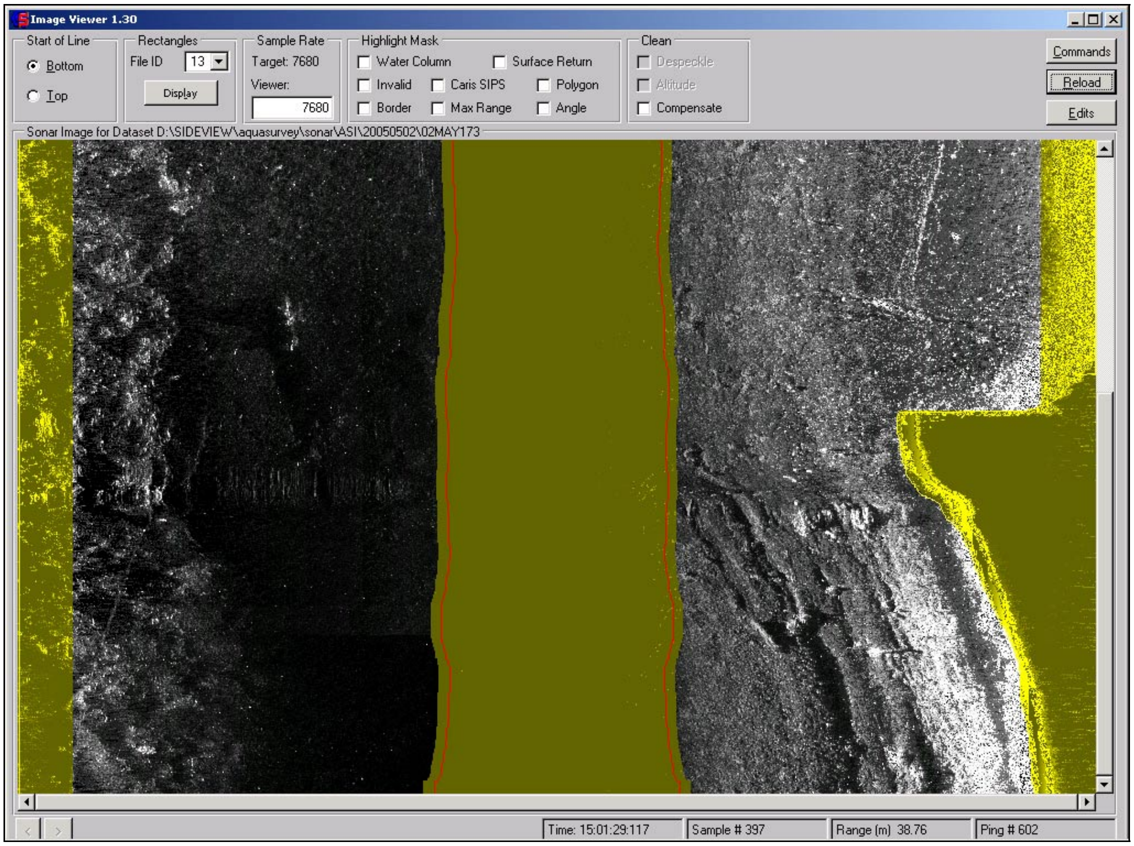


Figure 97. High quality uncompensated backscatter image. Transparent yellow areas indicate masked regions. This image is from file 02may173.mst.

For bottom classification, features are extracted from both backscatter image data and depth data using the following algorithms:

Basic Statistics: Mean, standard deviation, and higher-order moments are indicative of acoustic impedance changes and interface roughness.

Quantile and Histogram: These measure the distribution of backscatter information intensities at low resolution.

Power Spectra: Fast Fourier Transforms (FFTs) are used to find power spectra, which describe statistical characteristics on many resolution scales.

Ratios based on Power Spectra (Pace): Ratios of log-normalized power in various frequency bands provide good discrimination for classifying images.

Grey-Level Co-occurrence Matrices (Haralick): Grey-Level Co-occurrence Matrices (GLCMs) describe the amplitude changes over selected distances and directions in the image patch, and are widely used to assess texture.

These features have been selected to capture many useful aspects of the data. As QTC SIDEVIEW was developed, the selection of features was frequently examined to determine which features were providing useful discrimination and to determine if any algorithm consistently produced redundant features. One interesting result from these studies was that mean intensity was rarely the sole determining feature in the overall classification process. It is combinations of intensity and texture that seem to drive classifications.

A major strength of QTC SIDEVIEW processing is the incorporation of multivariate statistical techniques as they permit the use of many features. Experience has shown that some features are important in what might be called the standard classifications: mud, sand, gravel, and so on. Others are important for more specialized classifications such as discriminating among sand/mud mixtures. For any particular data set, PCA selects the features that are most useful for the discrimination task at hand. Features that are close to constant are largely disregarded. Redundancies, that is, correlated features, are also acceptable, but only one remains significant. What is left is a reduced feature set that compactly describes the diversity of the data set. While some features may have little diversity or be tightly correlated when used to describe one set of bottom sediments such as open continental shelf sand and gravel, they may be found to give useful discrimination in other cases, such as on deltaic sediments. Thus, the connection between features and classification adapts to the character of the data set.

For each patch of each image, the features are calculated and then arranged as a row vector containing more than 100 elements. The name given to these rows of features is Full Feature Vectors (FFVs). This information must be optimized or reduced without losing any details of the sediment. The dimension of the FFVs is reduced by multivariate statistical processing to isolate the combinations of features that are responsible for most of the diversity in the data set. In general, the top three combinations capture a very high percentage of the variance, so the rest of the combinations can be disregarded by the software. These top three combinations are called Q-values.

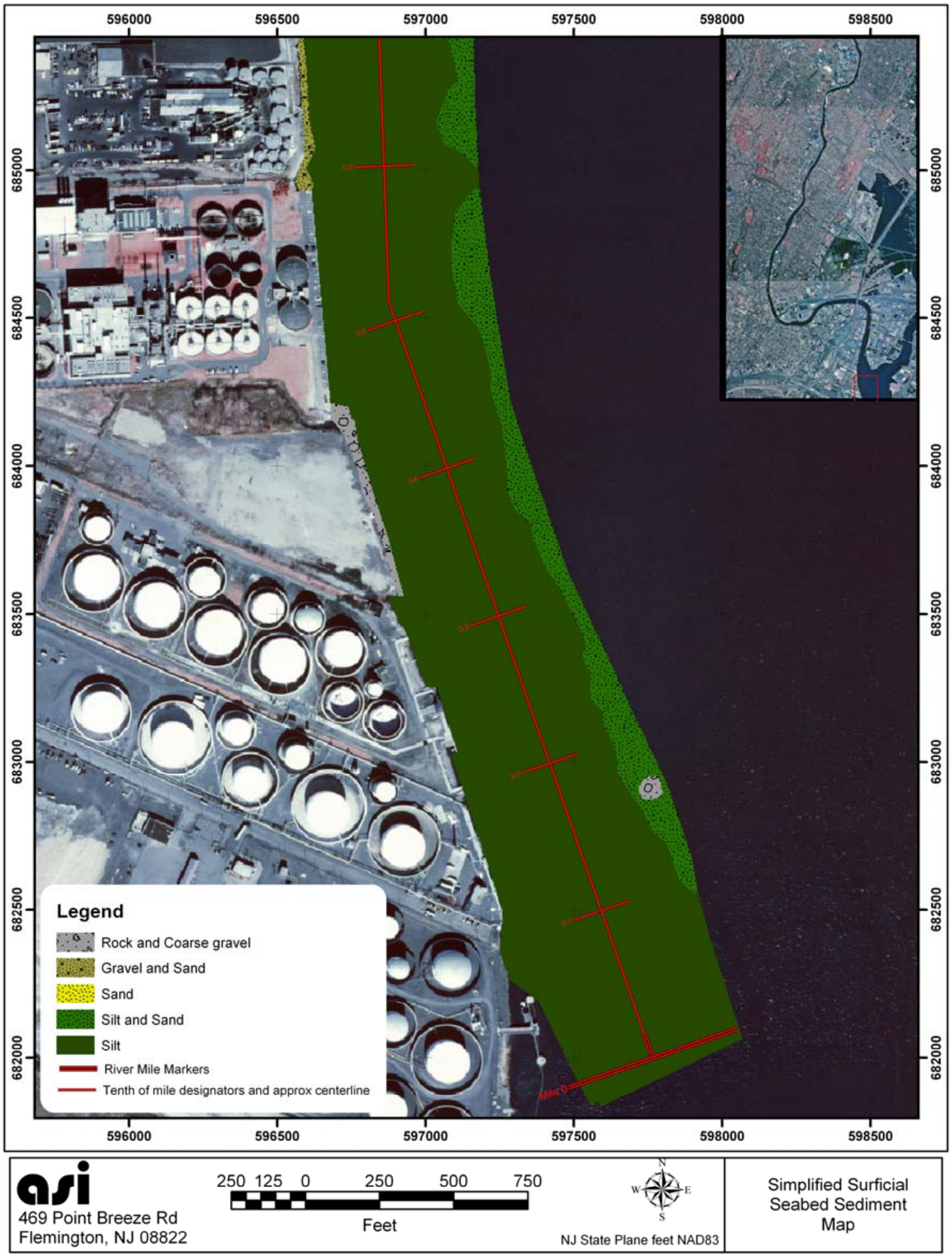
The result of this reduction process is contained in the reduction matrix. Any FFV can be reduced to three Q-values by matrix multiplication. The reduction matrix is part of the catalogue used for supervised classification. New FFVs, derived from any subsequent acoustic survey, can be reduced to Q-values in this way as part of the supervised classification process. Alternatively, the multivariate statistical processing can be run on any partial or complete data set to find new information.

The acoustic response - represented by Q1, Q2, and Q3 - from like bottom types will be similar. When plotted on a three-axis plot, called Q-space, points with similar values, for example from a single bottom type, form a cluster. Thus, data from three acoustically different bottom types form three clusters.

Quester Tangent's automated clustering technique produced nine acoustically distinct classes. The colors used in the plots are called Similarity Colors in which classes that are neighbors in Q-space are painted with similar colors. Each point in the maps is at the position of the centre of each rectangle. The classes were generally consistent (i.e., same class where data overlaps). Absolute ground types have not been assigned to the acoustic classes. Using ground truth information, association of acoustic class with sediment type is possible.

The resulting data file was merged with the position information to generate a geo-referenced classification data set constituting the final data product. This final Quester Tangent data set was superimposed over the sonar mosaic image. The Quester Tangent and sonar mosaic were used to better identify changes between sediment types. This combined image was used with the results from the shallow core ground-truthing (field geologist description and DESA lab results) to produce the regions constituting the final simplified surficial seabed classification shapefiles. The Quester Tangent classifications, intensity of sonar reflectors, field geologist descriptions, and DESA results were all used together in order to determine the surficial sediment at a given location. The DESA results and the field geologist descriptions were the primary sources for determining the nature of the surficial sediment material. The side scan sonar mosaic and the Quester Tangent classifications were the primary sources for determining boundaries between different materials. In cases where the sonar image and Quester Tangent classification differed from the field geologist descriptions and DESA results, the material most likely to be present based on field experience was used. In some cases, that would be the sonar classifications, where the material could not be collected using the sampling techniques employed during the ground truthing effort. In other cases the ground truthing results were used. Principally this was the case where the energy reflected back to the side scan sonar was stronger than it should have been for a certain material, primarily on slopes or when the towfish was very near the shoreline. The sonar data were used in all cases to better differentiate the borders between different materials.

The simplified surficial seabed classification showed silt as the primary sediment type, with various mixtures of silt, sand, and gravel present. A significant change occurs near the West Arlington Railroad Bridge. The riverbed downriver from this point can be described as primarily silt. Areas around bridges were found to have been scoured out and were less likely to have silt deposits. Since the shorelines along the river have been 'improved' to help control erosion, many areas were found to have rock and gravel forming the edges of the river. Above the West Arlington Railroad Bridge (river mile 8.1), the riverbed is much more varied. Primarily, the center of the channel is either sand or a silt/sand combination. Areas of silt are present, though primarily limited to the depositional areas on the inside of the bends in the river. From just below the 8th Street Bridge (river mile 15.3) in Wallington to the uppermost reach of the area surveyed, the riverbed consists primarily of sand and gravel, with large rock and boulders in certain areas. This section of the river is generally shallow with swift water flow.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Simplified Surficial
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Map

Figure 98. Simplified surficial sediment map 1.

Figure 99. Simplified surficial sediment map 2.

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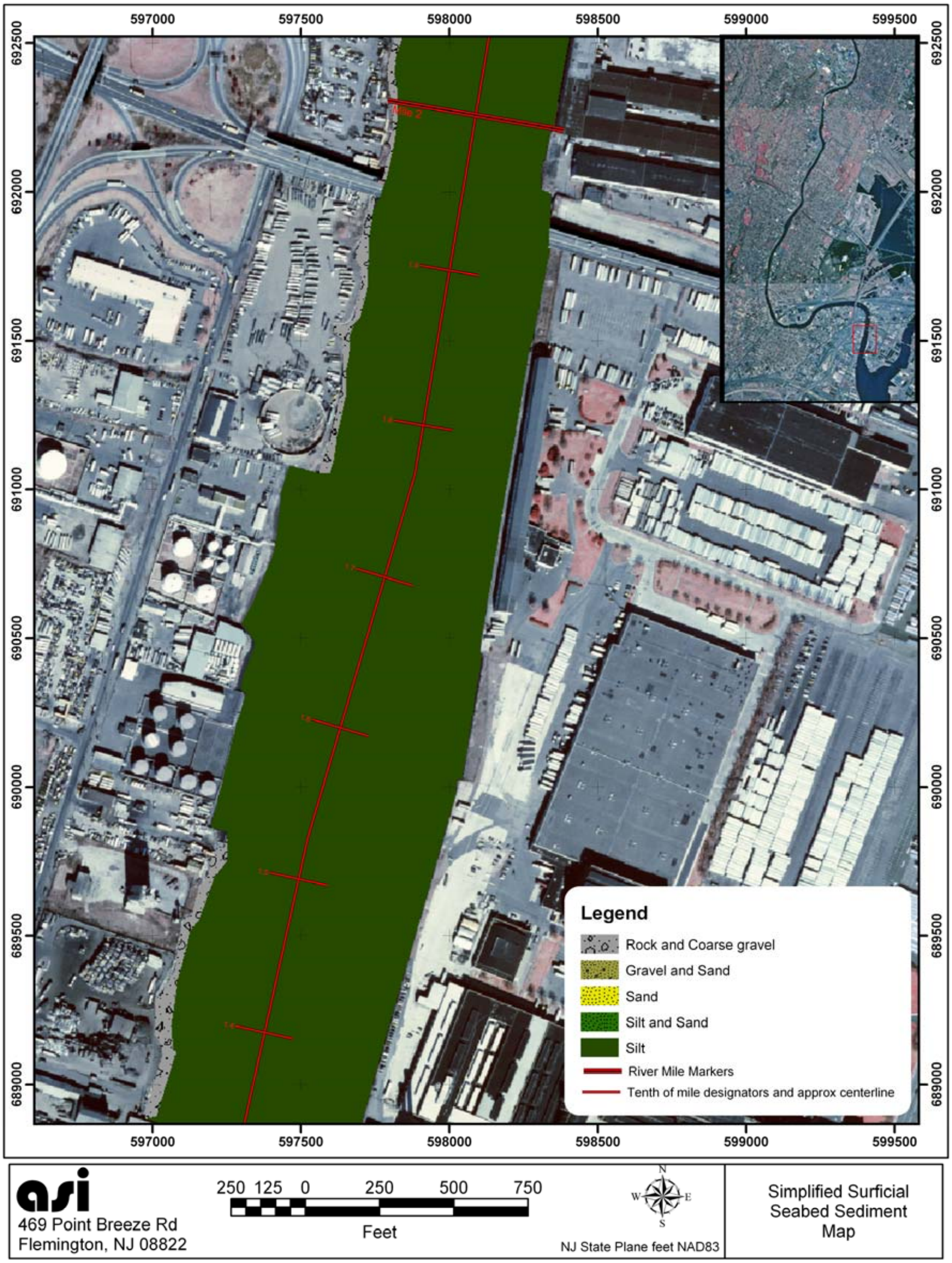


Figure 100. Simplified surficial sediment map 3.

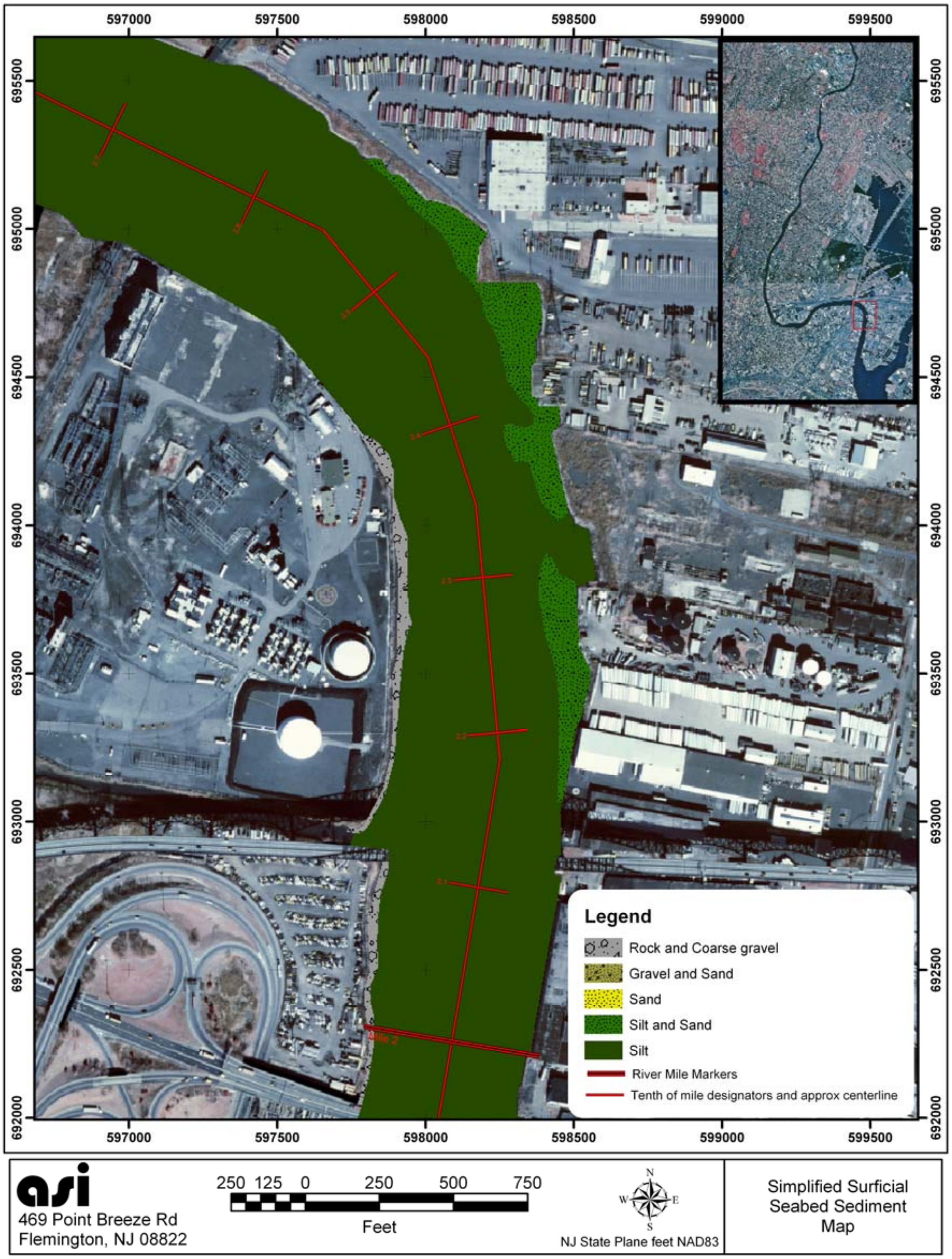


Figure 101. Simplified surficial sediment map 4.

Figure 102. Simplified surficial sediment map 5.

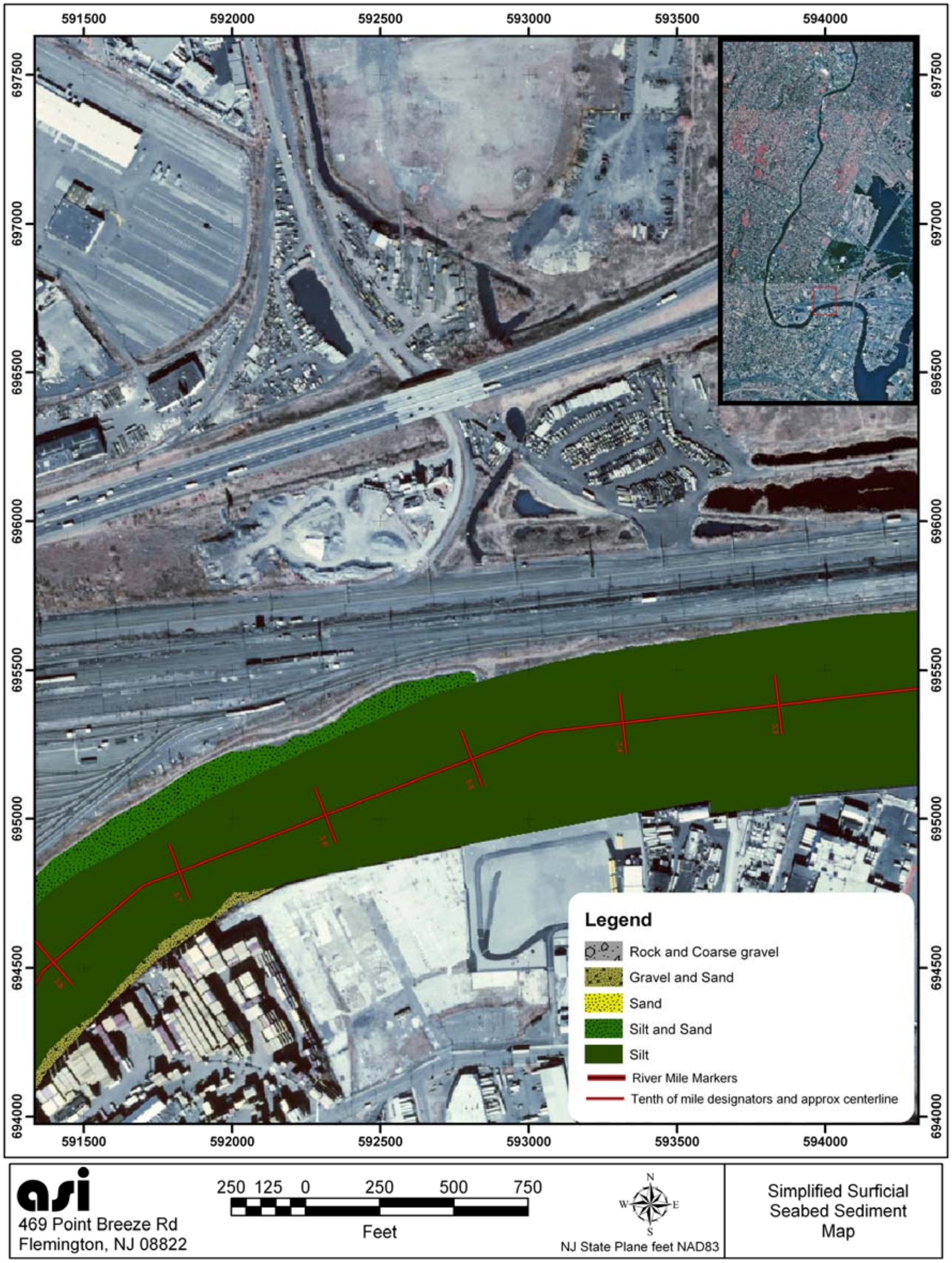


Figure 103. Simplified surficial sediment map 6.

Figure 104. Simplified surficial sediment map 7.

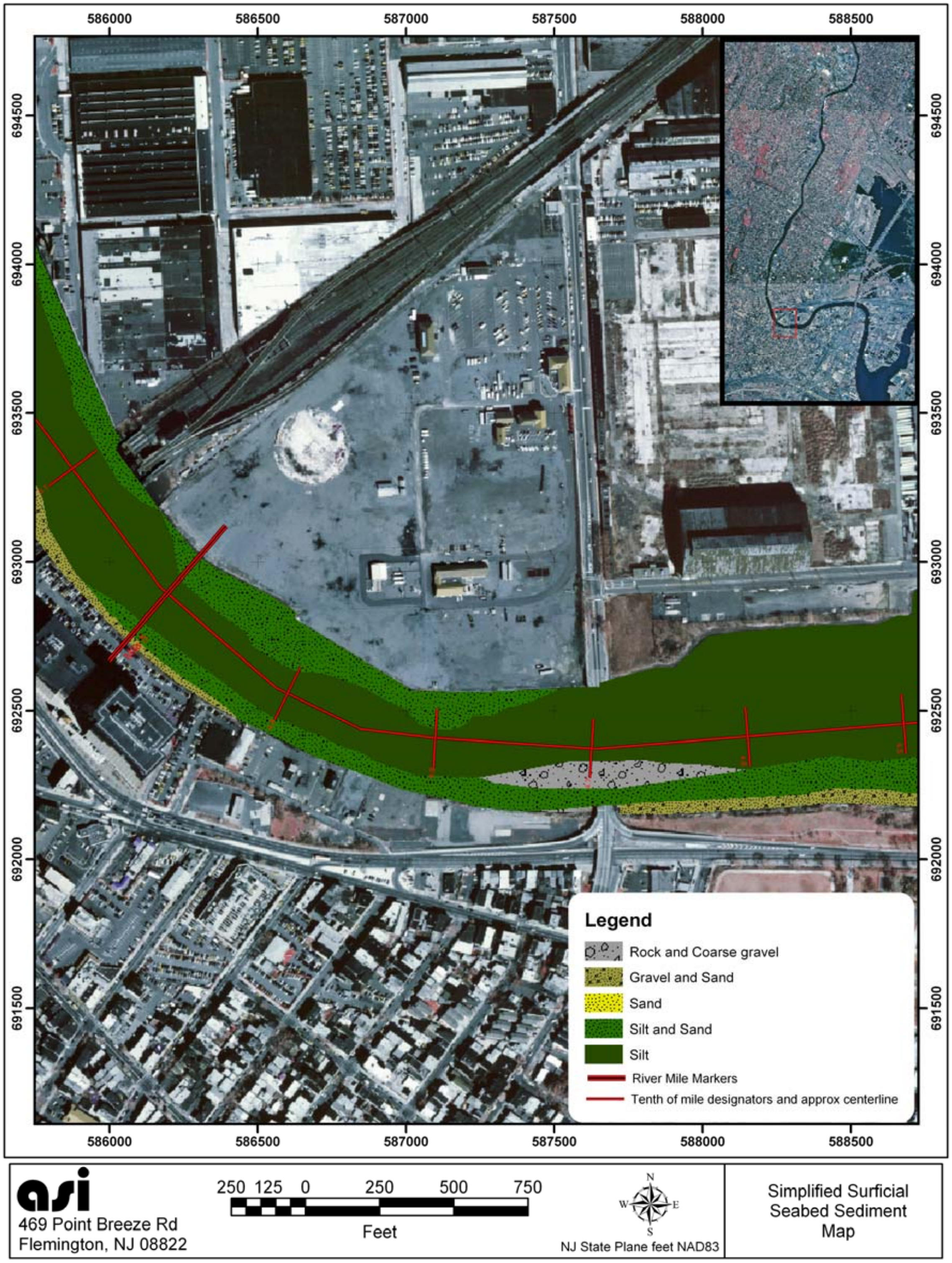


Figure 105. Simplified surficial sediment map 8.

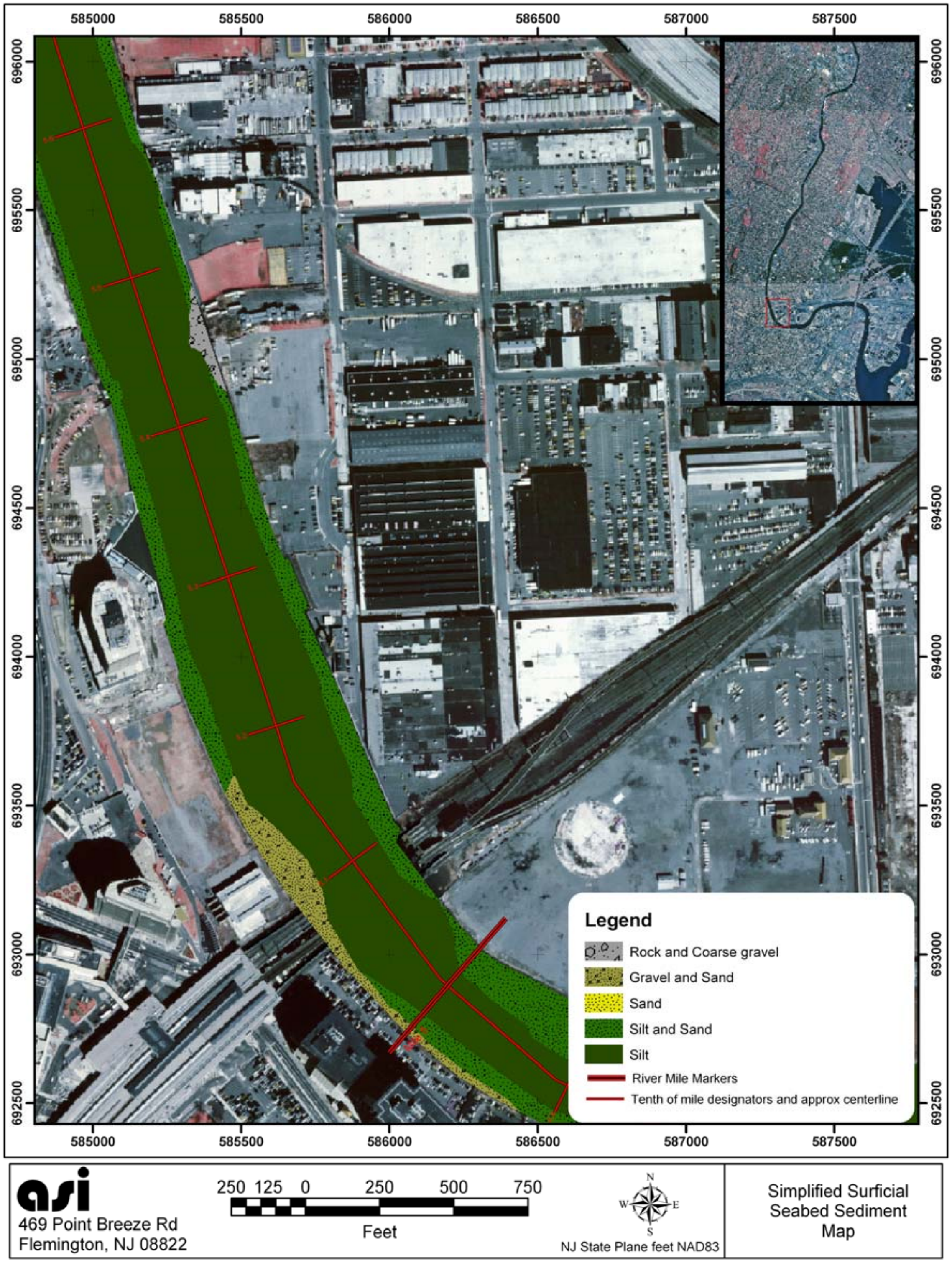


Figure 106. Simplified surficial sediment map 9.

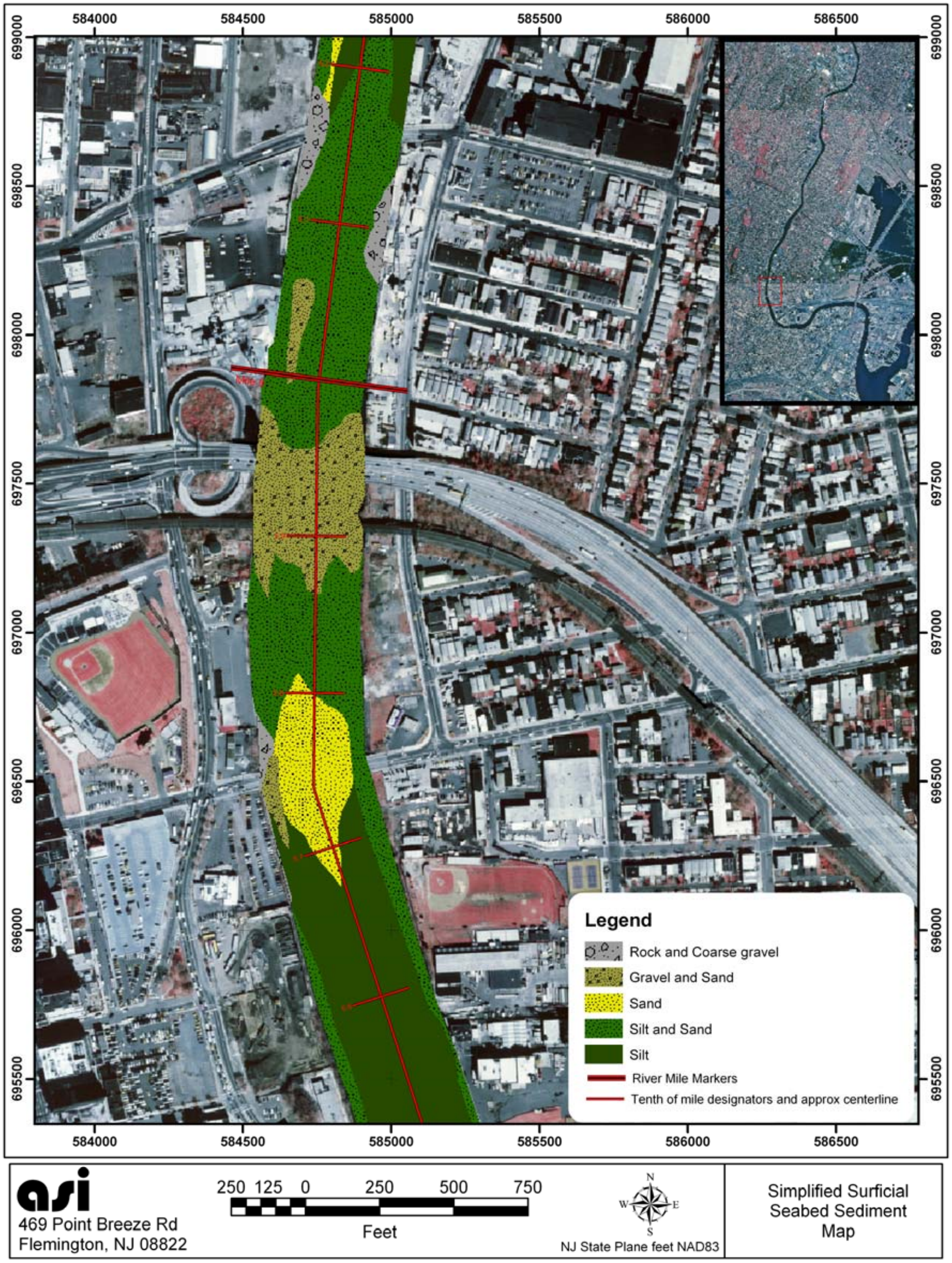


Figure 107. Simplified surficial sediment map 10.

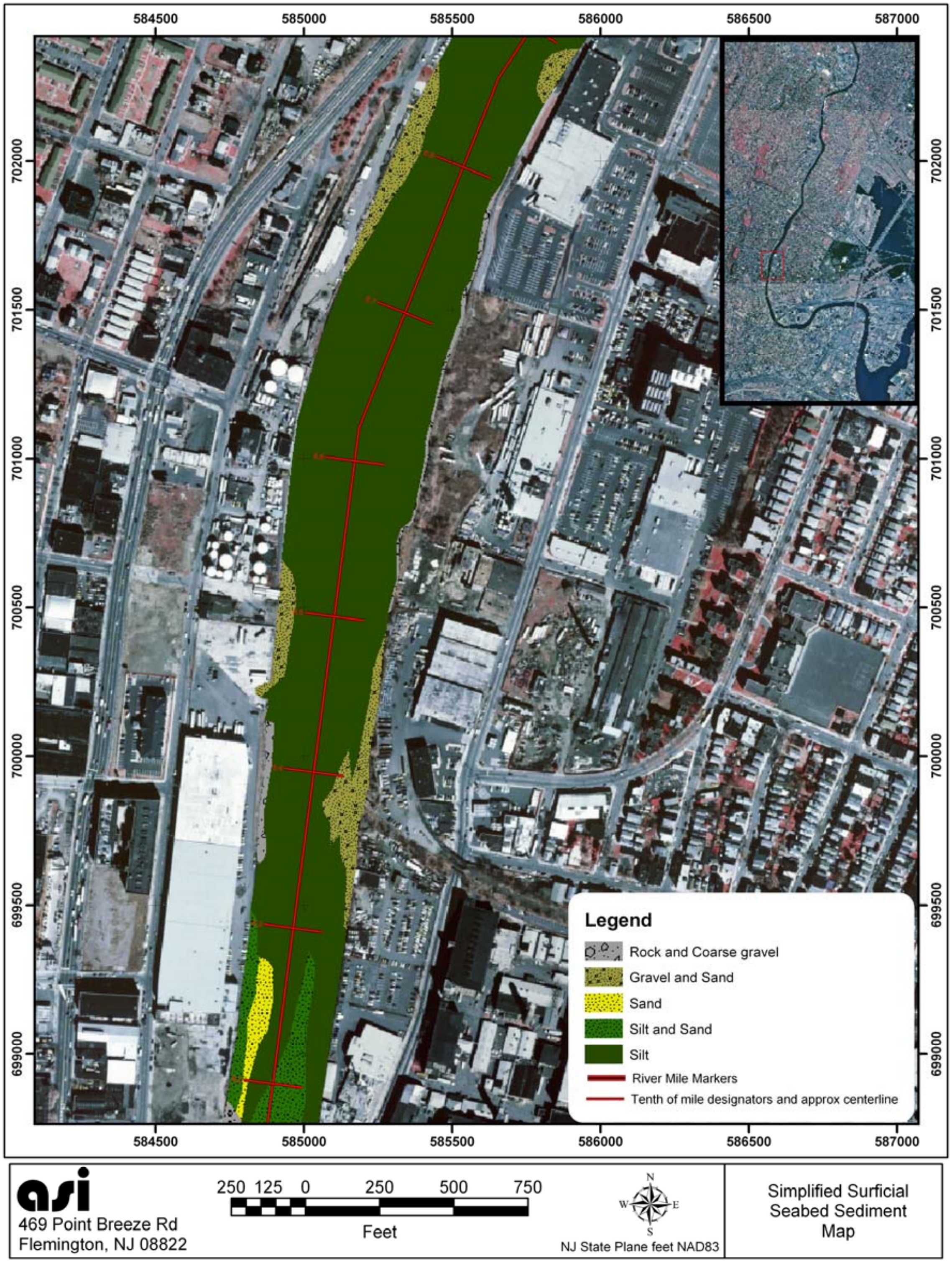


Figure 108. Simplified surficial sediment map 11.

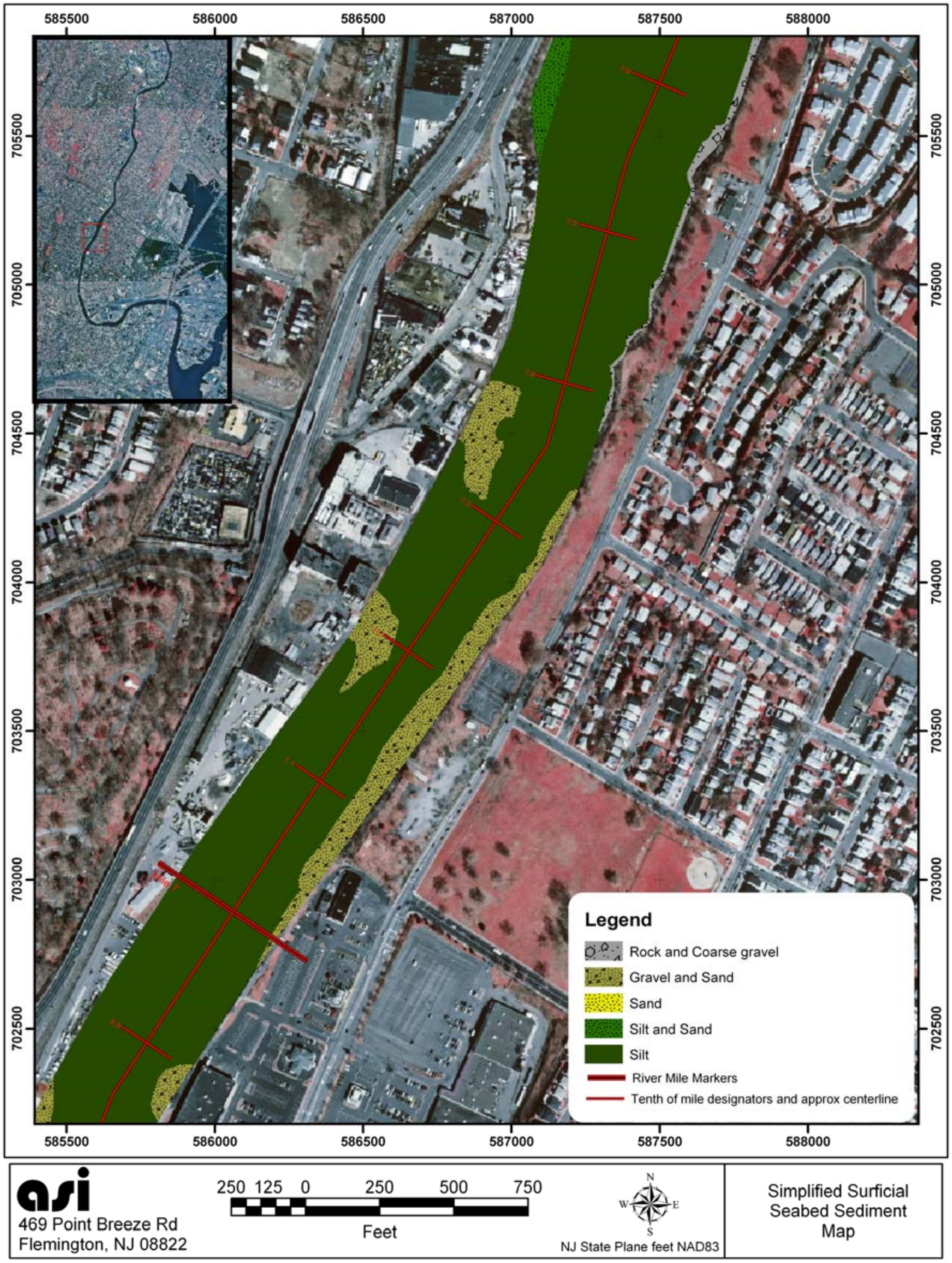


Figure 109. Simplified surficial sediment map 12.

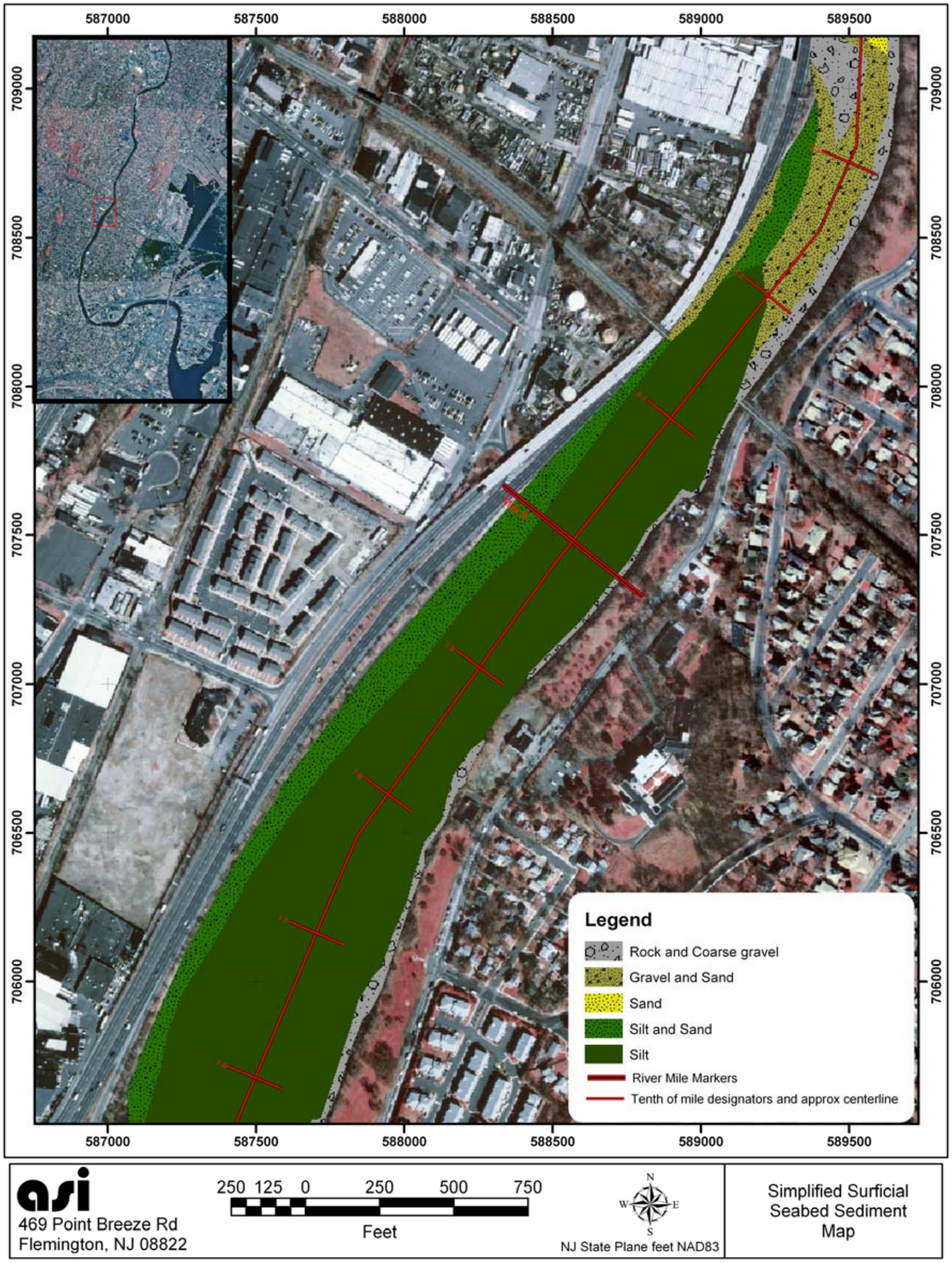


Figure 110. Simplified surficial sediment map 13.

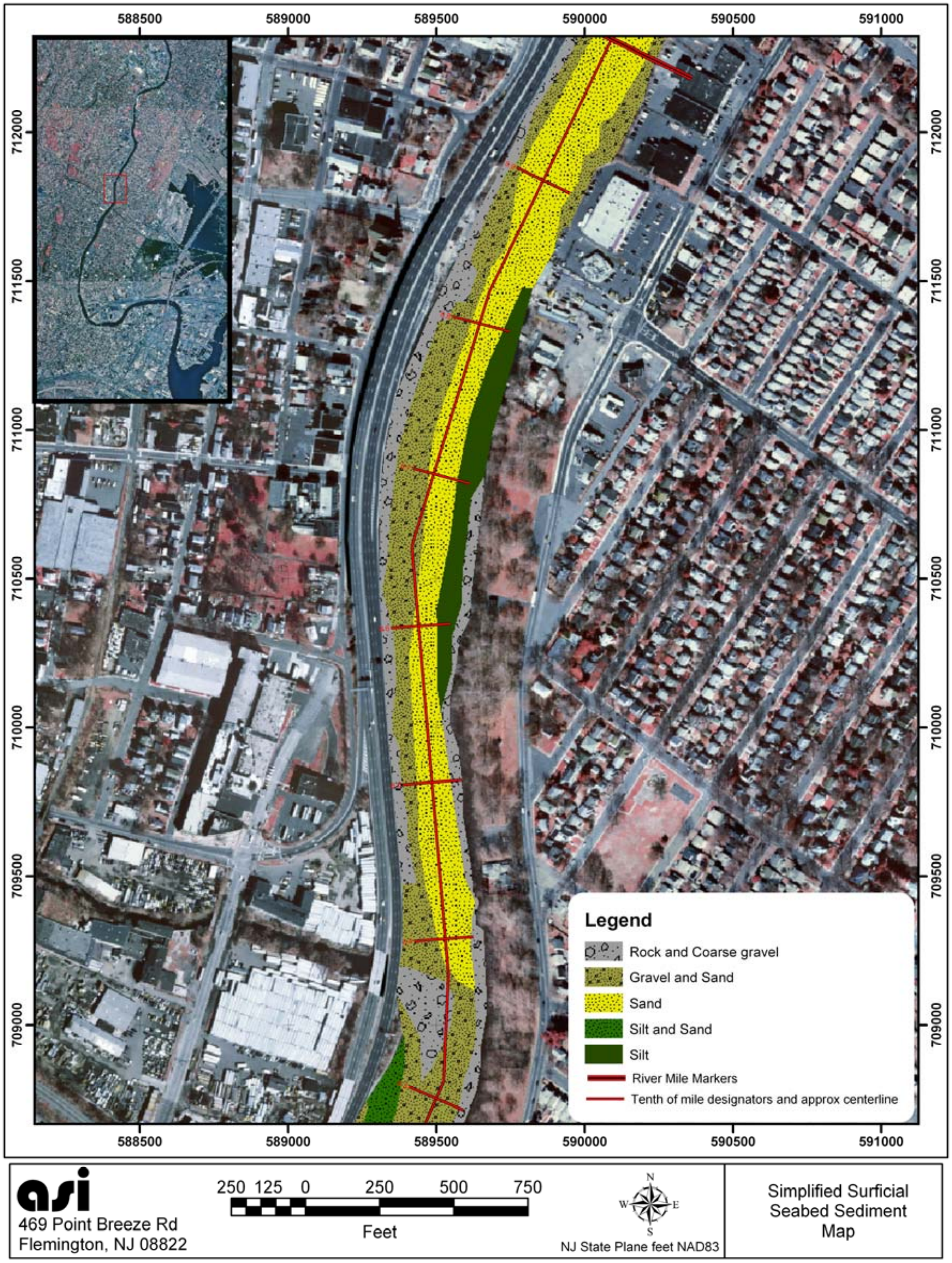


Figure 111. Simplified surficial sediment map 14.

Figure 112. Simplified surficial sediment map 15.

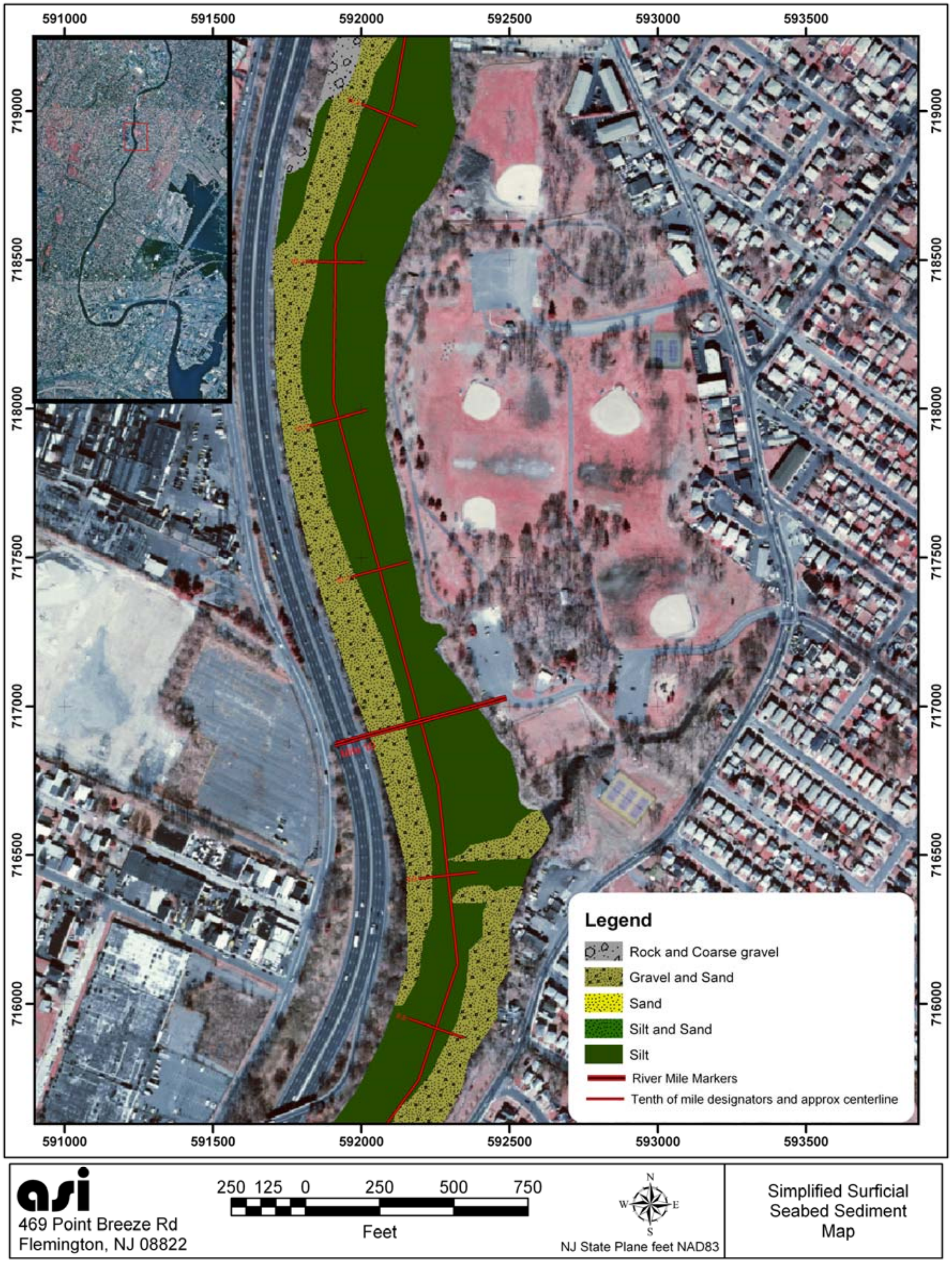


Figure 113. Simplified surficial sediment map 16.

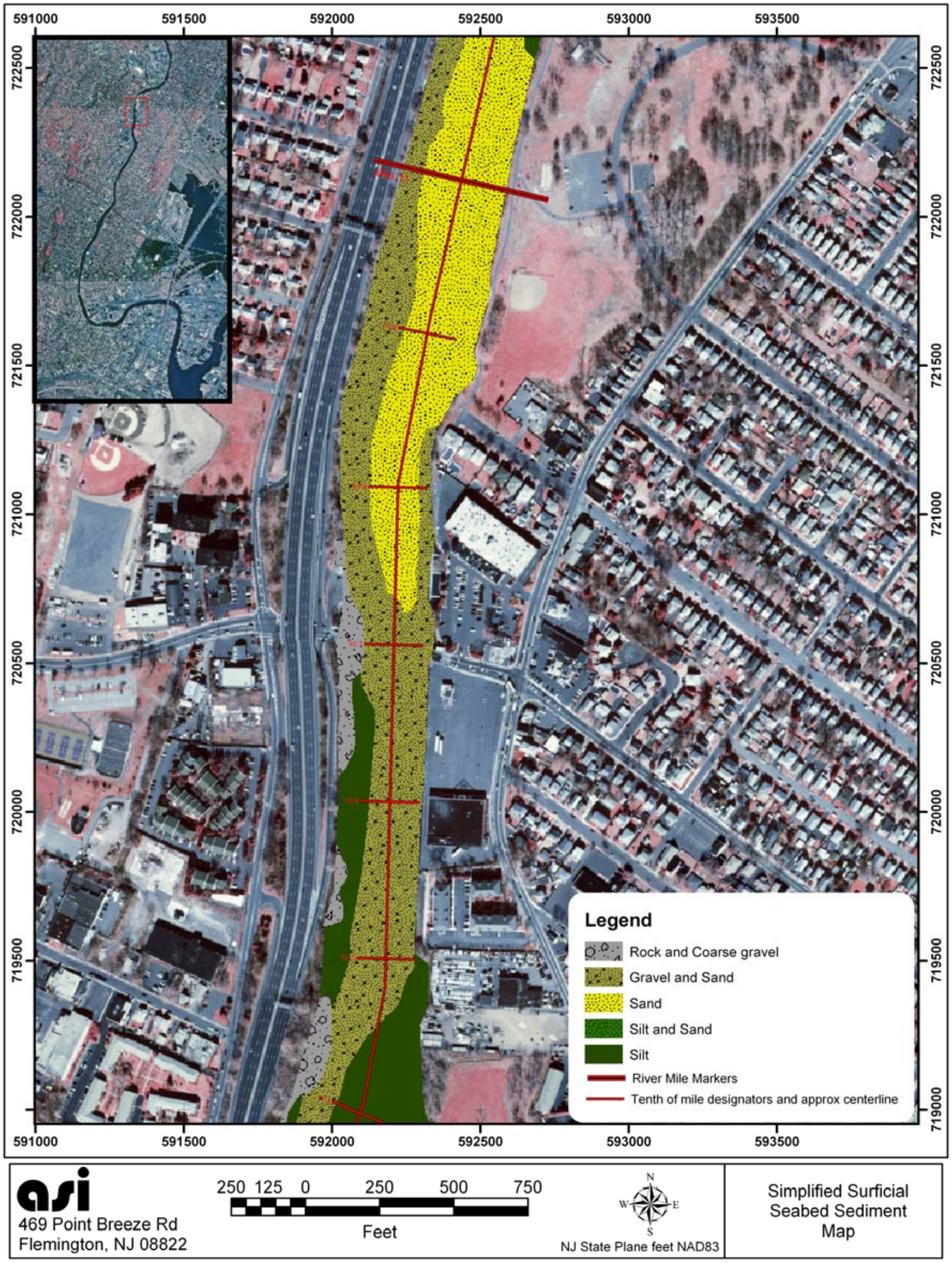


Figure 114. Simplified surficial sediment map 17.

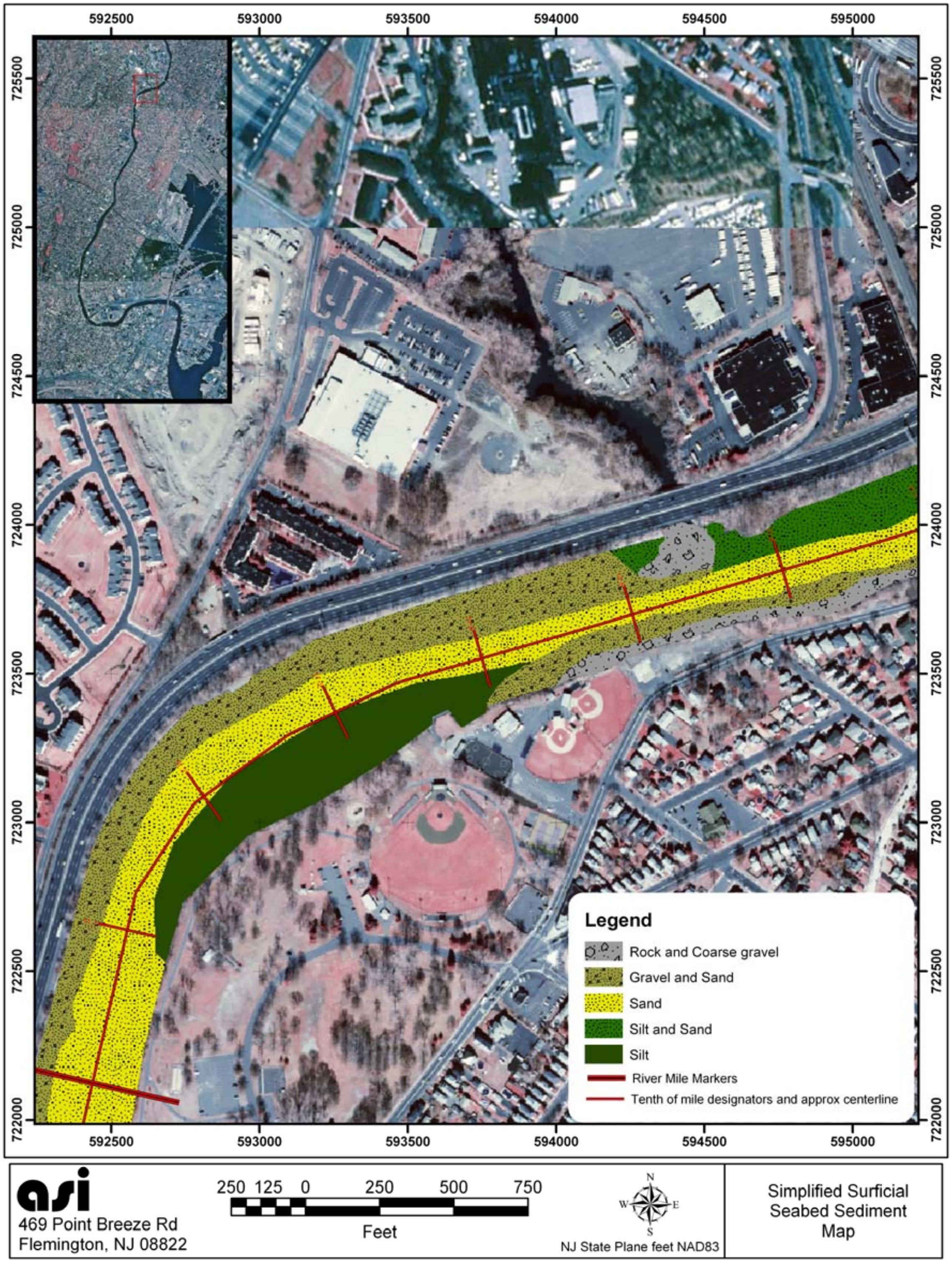


Figure 115. Simplified surficial sediment map 18.

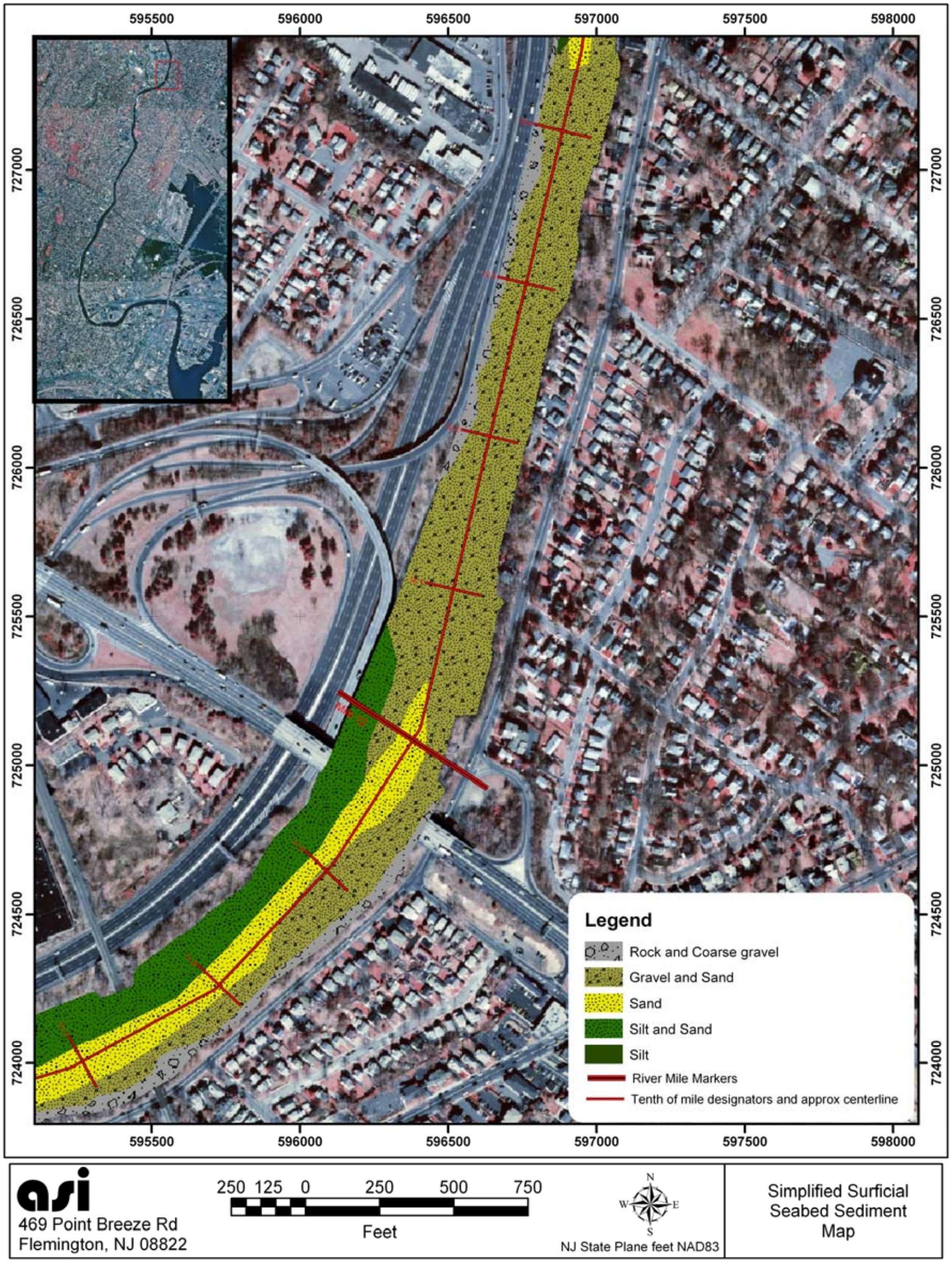


Figure 116. Simplified surficial sediment map 19.

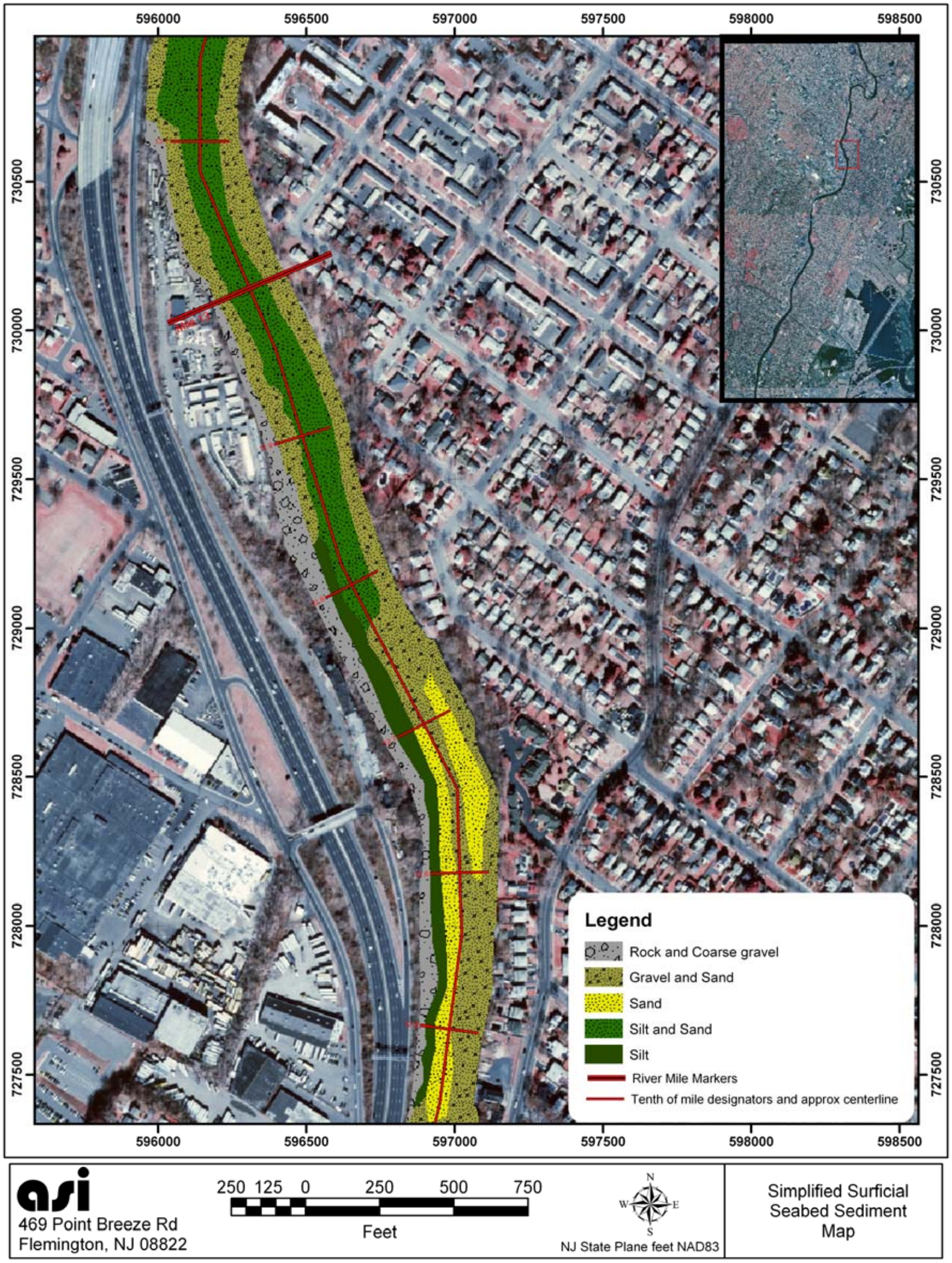


Figure 117. Simplified surficial sediment map 20.

Figure 118. Simplified surficial sediment map 21.

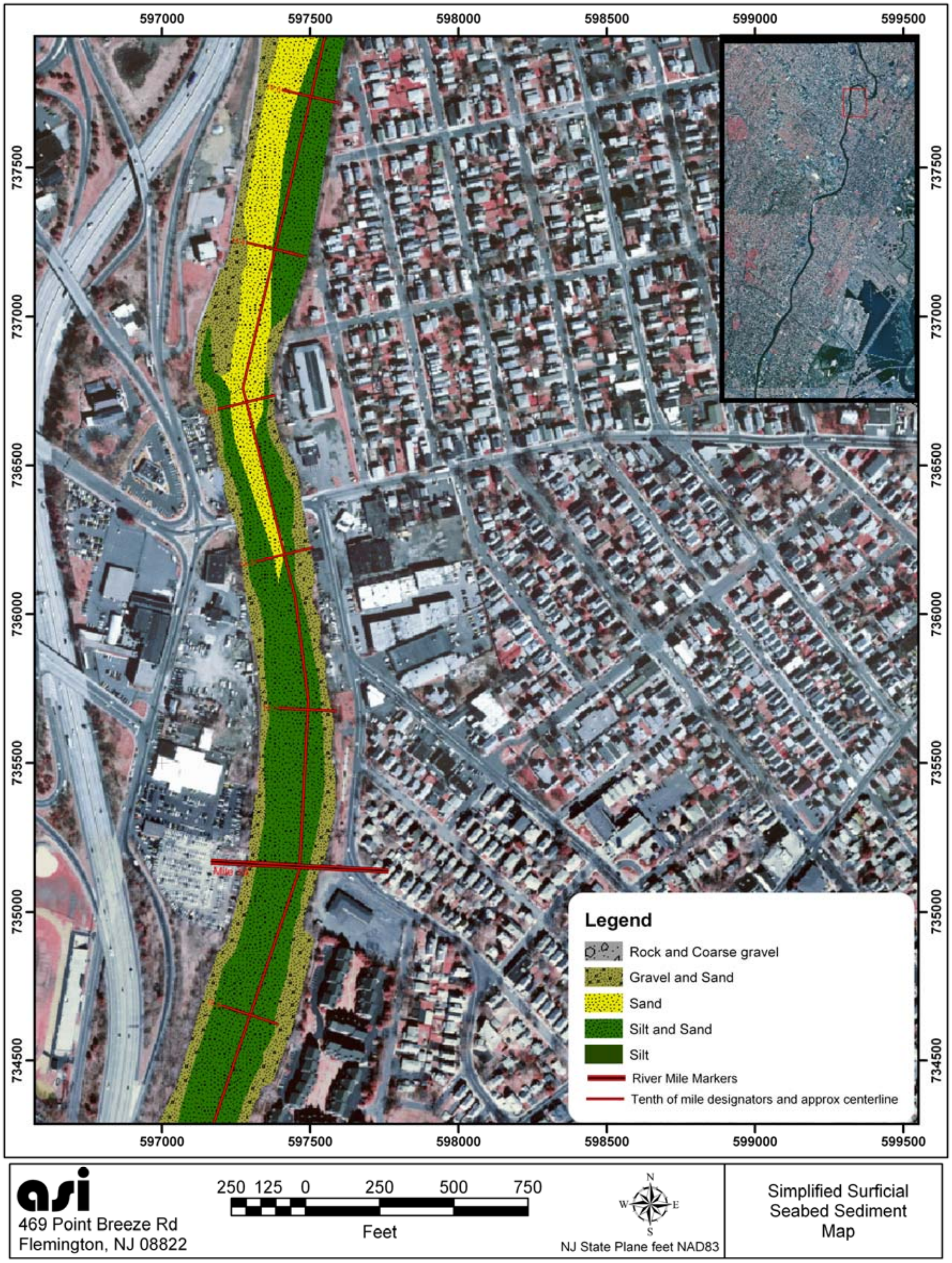


Figure 119. Simplified surficial sediment map 22.

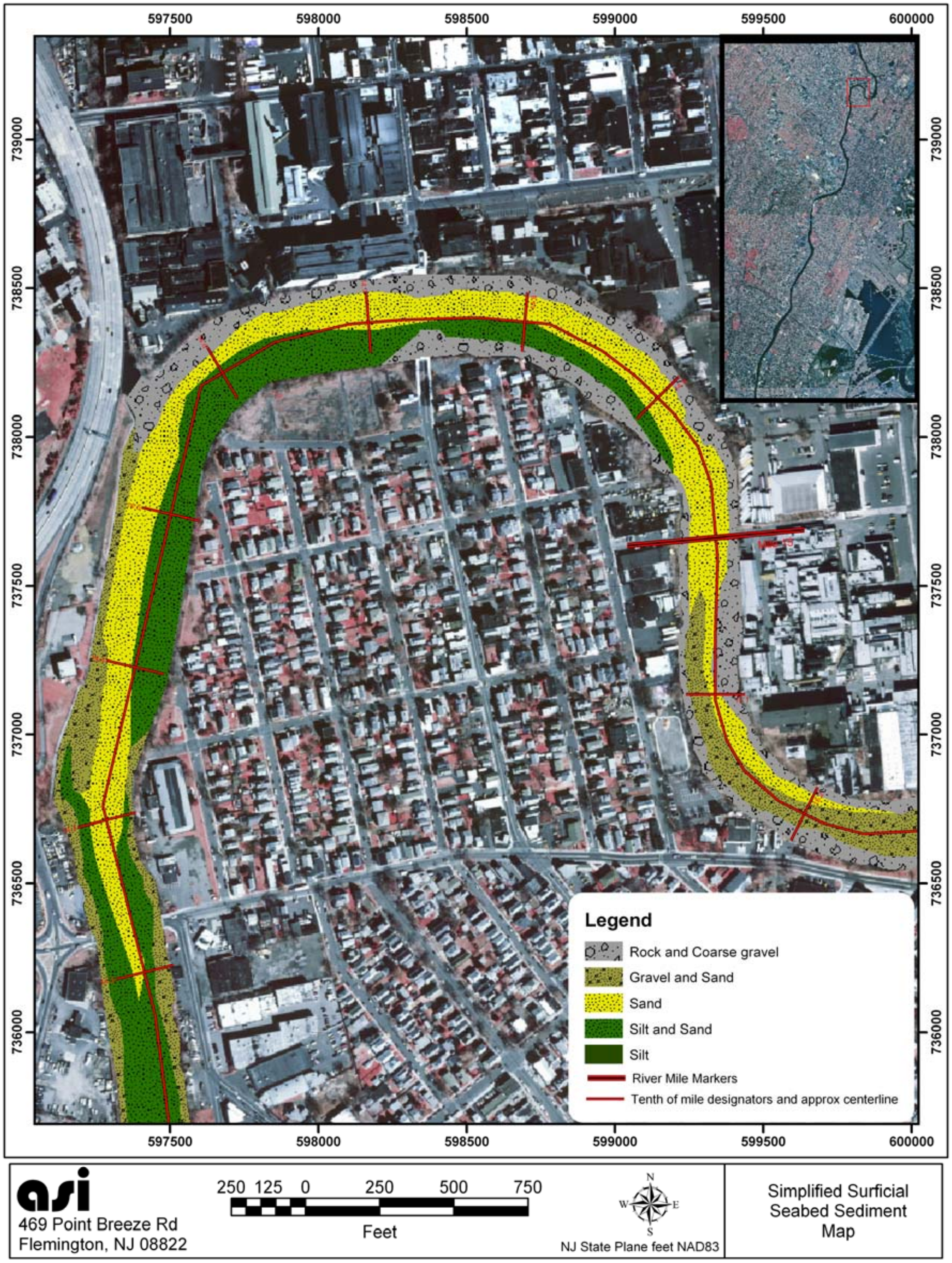


Figure 120. Simplified surficial sediment map 23.

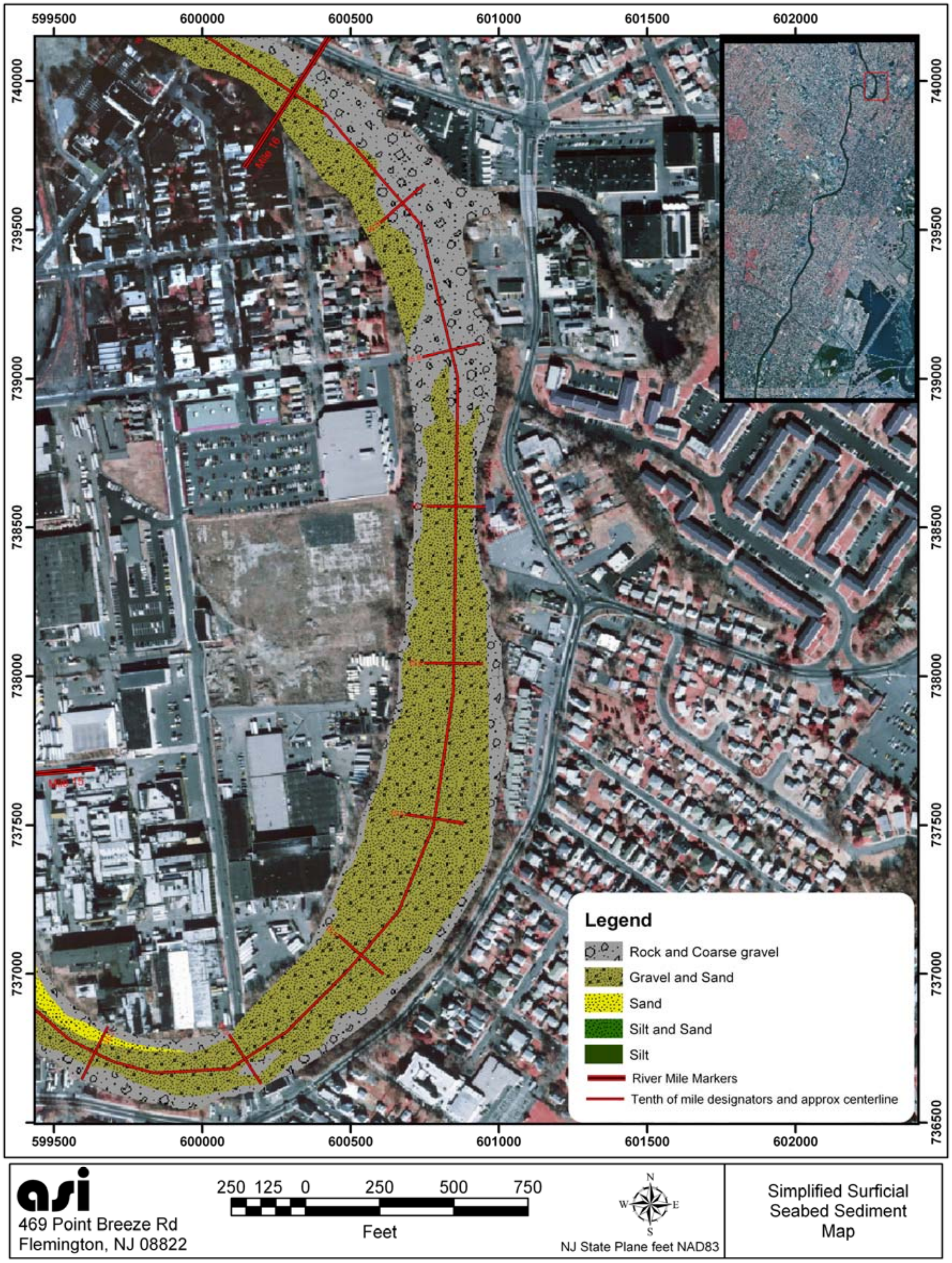


Figure 121. Simplified surficial sediment map 24.

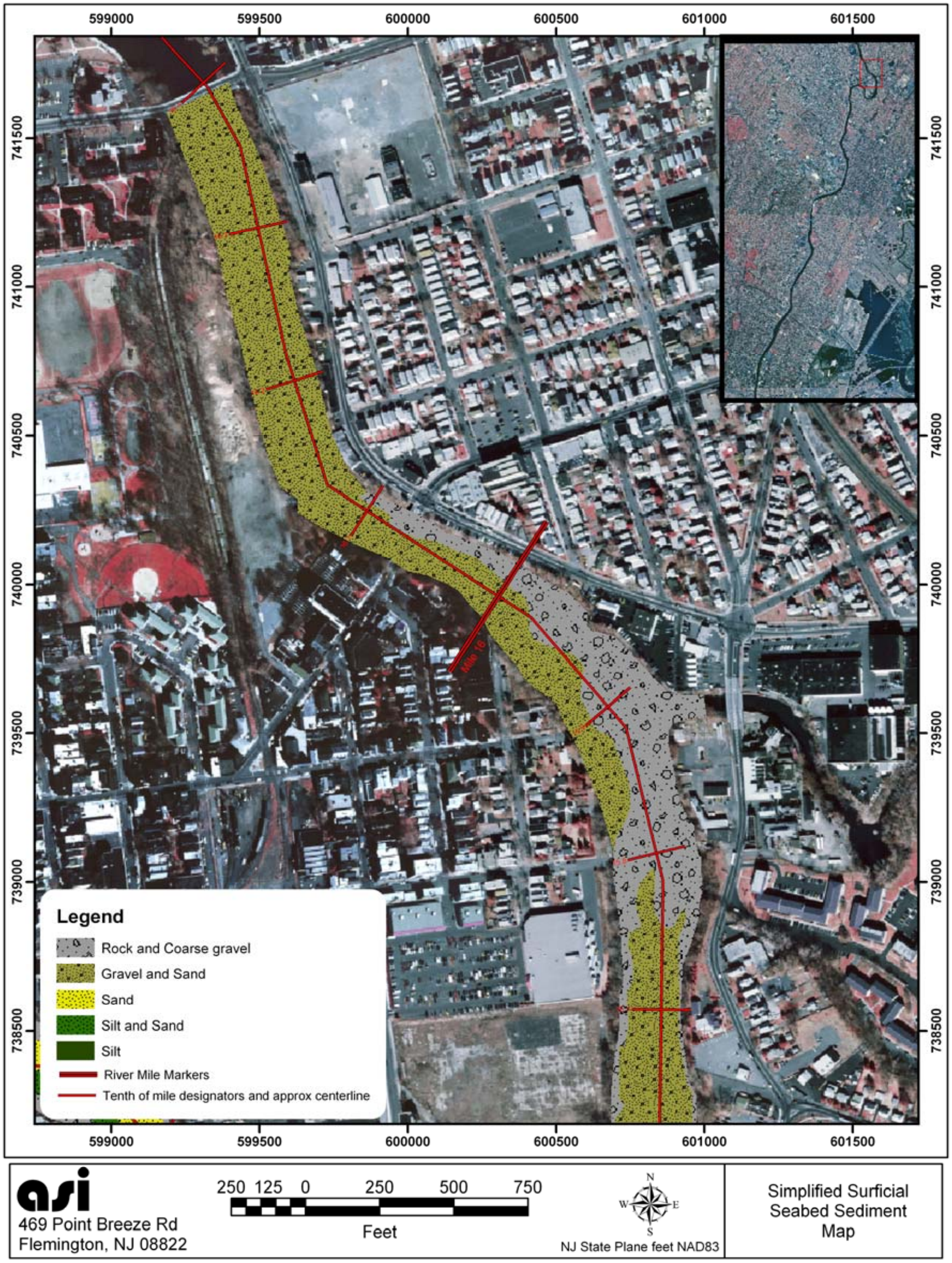


Figure 122. Simplified surficial sediment map 25.

Figure 123. Edgetech X-STAR sonar system. SB-216S towfish is shown on the left and topside amplifier, computer monitor, and digital recording system is shown on the right.

G. Sub-Bottom Profiler Survey

1. Sub-Bottom Data Collection

An Edgetech X-STAR sonar system with a SB-216S towfish (Figure 123) was used to collect the chirp sub-bottom profiling data during the survey along the Lower Passaic River. The principal objective of the survey was to collect chirp images to characterize subsurface sediments beneath the river bed and to use the chirp images to aid in the selection of sites where shallow (<3 feet) and deeper (6-20 feet) core samples could be collected.

Chirp profilers use acoustic methods to generate high-resolution (on the order of 0.5-1 foot) cross-sectional images of the marine sub-bottom to depths of up to 100 feet beneath the seafloor. These profilers transmit a wide band FM sound pulse that is linearly swept over a full spectrum frequency range (i.e., a “chirp”). The transmitted sound pulses travel through the water column and sub-bottom and are reflected when changes in acoustic impedance (equivalent to a material’s sonic velocity times its density) are encountered. Acoustic impedance changes commonly occur at boundaries between materials (e.g., interfaces between water and sediments, sediments and gas, and sediments and buried objects). The reflected sound pulses travel back to the profiler where their amplitudes, as a function of travel-time, are digitally recorded.

During the survey, the SB-216S was towed at a depth from 3 to 5 feet. It was towed approximately 6 feet aft of the navigational antenna on the port side of the research vessel Abigail. The estimation for the layback error is 1 to 2 feet. The SB-216S emitted a chirp sound pulse with a frequency range of 2-12 kHz, eight times per second. Given this sampling interval with an average speed of 2 to 3 knots, the horizontal spacing between individual pulses displayed on the chirp profiles was on the order of 0.4-0.6 feet.

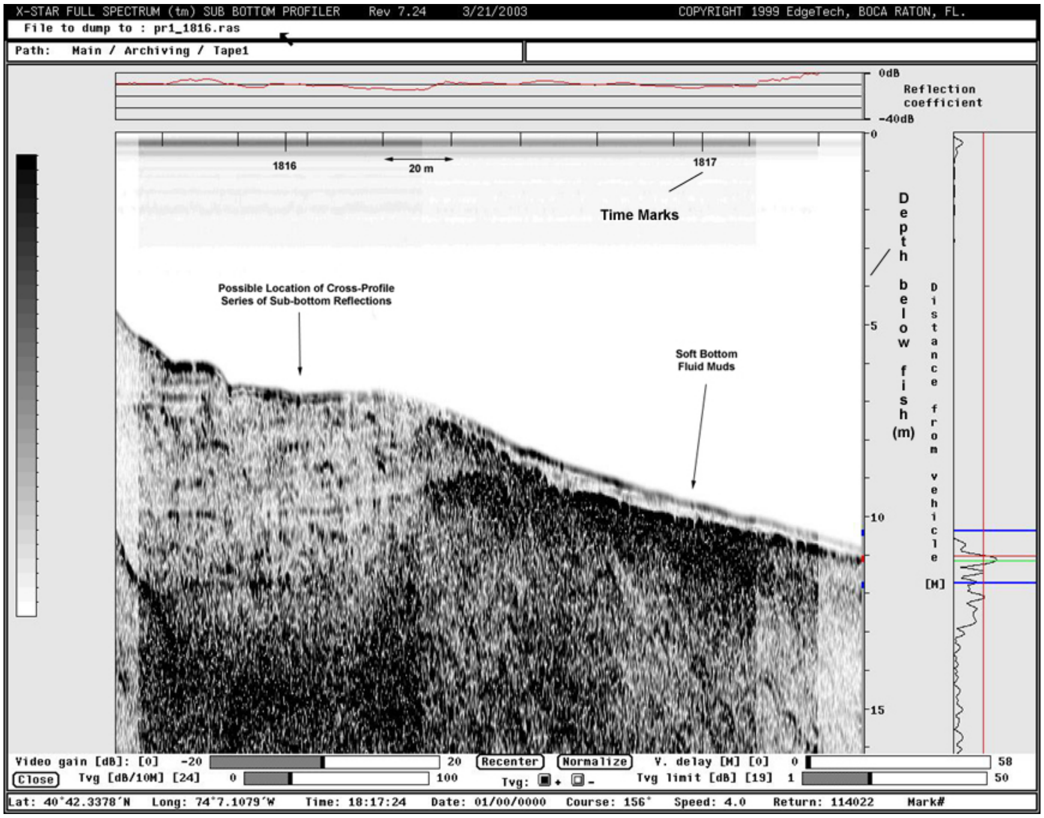


Figure 124. Example of X-STAR monitor "real-time" chirp system output. A series of reflections, as a function of depth beneath the towfish, are shown in the center. The strength of the river bottom reflection (shown along top) and sub-bottom events (shown to the right) are also displayed. Along the bottom, RTK-DGPS derived position, time, course, and speed are shown.

Geographic position (i.e., latitude and longitude) along the chirp profiles was determined with Trimble RTK-DGPS. The data from the RTK-DGPS were also used by the HYPACK Max 4.3 survey control software. Navigational data were logged at one-second intervals by the X-STAR digital recording system. The estimate of the positional accuracy of the RTK system is 1-centimeter in the horizontal and 2 centimeters in the vertical axis.

During the chirp survey, the data were observed in "real-time" on the X-STAR monitor (Figure 124). The data displayed included the reflection coefficient of the river bottom (a measure of the acoustic impedance contrast at the water/sediment interface), the relative amplitude of bottom and sub-bottom reflections, a cross-sectional image of the last ~600 chirp pulses that were recorded, as well as the current position, time, date, course and speed of the *Abigail*.

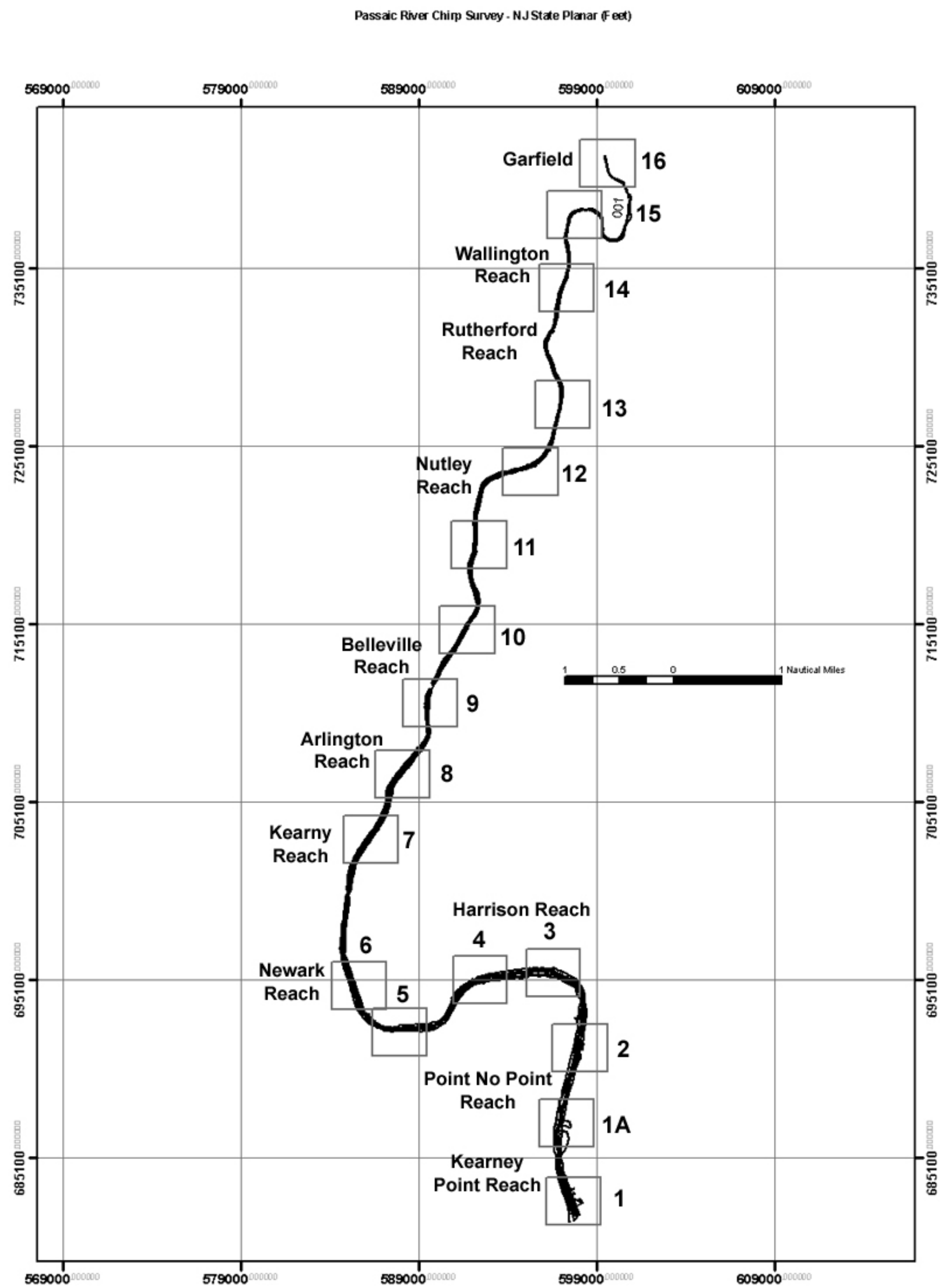


Figure 125. Tracklines of the Abigail during the chirp survey. Boxes denote approximate locations of transects where cross-river chirp profiles and deep cores (vibracores) were collected. The specific locations of the cross-river profiles and deep cores are shown in Figures 126-142.

Shown in Figure 125 are the tracklines of the *Abigail* during the chirp survey. Also shown in this figure are the general locations of the transects (1-16) where cross-river chirp profiles and deep cores (vibracores) were collected. The location of the cross-river chirp profiles were initially chosen with the objective of having a series of three closely spaced (~200-300 feet apart) profiles selected within approximately each one mile stretch of the Lower Passaic River between the Kearny Point Reach and the Garfield Reach. Within each 1 mile stretch, the positions of the cross-river profiles were chosen based on reflections observed in the along-river chirp profiles indicating the presence of sub-bottom features of interest.

2. Sub-Bottom Survey Results

Shown in Figures 126 to 142 are the locations of the chirp tracklines and deep cores that were collected in the transect areas. For transect areas 1-15, these chirp profiles include cross-river lines (Figures 126 to 141). Due to the narrow width of the river along the Garfield Reach (river mile 15.3 to 16.5), the chirp profiles shown for transect 16 are along-river lines only (Figure 142). Also shown in Figures 126 to 142 are locations within the transect areas where no penetration of chirp sub-bottom energy occurred. As discussed in further detail below, the primary causes for the lack of acoustic penetration are the presence of a layer of leafy organic matter on the river bottom and/or organic-rich silt layers in the shallow sub-surface sediments. These layers are known to have high concentrations of gas that prevents deeper penetration of the chirp acoustic signal.

Shown in Figures 143 to 160 are the chirp profiles that were collected along the deep core sites. The chirp profiles shown in Figures 143 to 160 are illustrative of the quality of the sub-bottom data that was collected along the Lower Passaic River between the Kearny Point Reach and the Garfield Reach, a distance of approximately 17 miles. Some of the sub-bottom reflections seen in these profiles can be correlated with the sediments that were described from the deep cores. All of the chirp profiles that were collected can be viewed in the supplied GIS data set.

The depths of the chirp sub-bottom reflections were calculated assuming a sound velocity of 1500 m/s. This is a typical velocity for sediments that are water-saturated, which is a reasonable assumption given the rather shallow depths of penetration. Even if velocities varied on the order of 50 m/s, as a function of the different types of sediments and their water content, the possible errors in depth estimations would vary only on the order of tenths of feet for the depth intervals over which the chirp reflections were observed.

The maximum depth of penetration of the chirp sonar of near 25 feet was limited by water depth as well as other factors. The greatest penetration depths occurred along the Kearny Point Reach in the general area of Transect #1A (see Figure 143 for example chirp profile and Figure 125 for general location of the reach). In this area, a series of chirp reflections can be correlated with alternating layers of sand, sandy-silty clay, and clay as confirmed by deep core DC1C. Beneath the depth of refusal of this core (9.5 feet) additional chirp reflections can be seen, suggesting that these alternating layers continue to depths approaching 20 feet beneath the river bottom (Figure 143). Chirp profiles along which significant deep reflections were observed (defined as reflections occurring at depths below the river bottom of more than 6 feet and that were continuous over horizontal distances of at least 20 feet) are identified and can be viewed in the supplied GIS data set. In the GIS data, the profile lengths shown correspond to one chirp file (5,000 traces of data) covering a horizontal distance of approximately 3000 feet. This does not imply that deeper reflections are present along the length of the entire profile, but it does provide an easier way to identify areas of useful deeper sub-bottom reflections.

Additional areas along the river where depths of penetration deeper than 10 feet were observed included the area near the Arlington and Belleville Reaches (river miles 7.1 to 8.4 and 8.4 to 9.8, respectively) as seen along Transect #9 where a sub-bottom chirp reflection deepens from 6 feet beneath deep core DC9-A to over 14 feet beneath deep core DC9-B (Figure 152). Unfortunately there was no recovery from these cores, so the sediment characteristics associated with this reflection could not be determined. Along Transect #12 in the Nutley Reach, a series of deep chirp reflections (14 feet to 20 feet beneath the river bottom) are observed beneath deep cores DC12-B, DC12-C and DC12-A. In the Garfield Reach in the vicinity of deep cores DC16-B and DC16-C, a sub-bottom reflection can be traced between depths of 9 feet to nearly 15 feet along the length of the chirp profiles shown in Figures 159 and 160. Similar to the data collected along the Arlington and Belleville Reaches, in the vicinity of Transects #12 along the Nutley Reach and along the Garfield Reach deep cores did not penetrate to the depths where the chirp reflections occur (Figures 155, 159, and 160). Thus it is not possible to interpret these reflections in terms of possible changes in sediment types at these depths.

A major factor that made it difficult to observe the presence of deeper reflections in the chirp data was the relatively shallow water depths in the project area. Shallow waters exacerbate the problem of multiples in sonar data. A bottom multiple is a reflection event that is generated when the chirp sound pulse travels from the towfish to the river bottom, reflects to the air/water interface where the sound is reflected back down into the water column, it reflects again off the bottom, and then travels to the towfish. Multiples appear in the chirp profiles as events occurring at regular, deeper (i.e., greater travel time) intervals essentially paralleling the river bottom. An example of bottom multiples masking the possible presence of sub-bottom reflections is shown in Figure 144 along the eastern portion of chirp profile 1A-C. Bottom multiples can be observed in nearly all of the representative chirp figures with the exception of Figure 143 where water depths are greater than 20 feet and thus multiples would appear deeper than shown in the portion of the chirp profile that is displayed.

Another type of multiple that is observed in the chirp data is a “ghost” multiple that is created by sound energy reflecting off the river bottom, then reflecting off the towfish, and finally reflected off the river bottom again before being recorded at the towfish.

Identifying characteristics of the "ghost" multiple are that it parallels the river bottom at a height above the bottom multiple that is equivalent to the depth of the towfish and that it is most prevalent when there is little acoustic penetration into the sub-bottom. Examples of the "ghost" multiple are shown in Figures 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 155, 156, 157, and 158.

In order to confirm that "ghost" multiples, rather than reflections due to changes in sediment types in the sub-surface, were observed in the chirp profiles, analyses of the two-way travel times for reflections that could possibly be "ghost" multiples were carried out. This was done by calculating the two-way travel time along the ray path using 1,500 m/sec water velocities. In all cases in which "ghost" multiples were identified, the two-way travel times indicated depths above the bottom multiple that correlated with the depth of the towfish. In the GIS data set that accompanies this report, all of the bottom and "ghost" multiples are identified on the chirp profiles.

The depth of penetration of the chirp system was limited by gaseous materials present along the river bottom and by some of the bottom and sub-bottom sediment types. The presence of a layer of leaf organic matter along the river bottom prevented the penetration of significant sound energy into the sub-bottom. Decomposition of the leafy material produces gas which creates a very high acoustic impedance contrast and causes acoustic energy to be reflected, rather than penetrating into the sub-bottom. Where present, leaf matter was associated with a very strong bottom return and the absence of underlying sub-bottom reflection events. The presence of leaf and other near-surface debris was documented along Transect #2 in the Point No Point Reach at deep core DC2B (Figure 145). Although this deep core delineated several layers of varying sediments, there were no associated chirp sub-bottom reflections due to the lack of sound energy penetrating the bottom.

In addition to the leaf organic matter, the presence of organic-rich silt layers near the surface also limited the penetration of the chirp sound energy. Organic material, as it decays, releases gas. If the gases are trapped within the pores of the sediments they limit the deeper passage of sound waves. For example, near-surface silt layers with organic material were found at deep core DC6-B along Transect 6 in the Newark Reach (Figure 149). The bottom reflection at this location is characterized by a very high amplitude with little evidence of acoustic energy penetrating into the bottom.

Based on an analysis of the chirp data, approximately 5 percent, or 4.5 out of the 85 miles of trackline surveyed along the Lower Passaic River had no significant penetration of chirp sound energy into the sub-bottom. Areas where no sub-bottom penetration occurred in the vicinity of Transects #1A-16 are shown in Figures 126-142 and examples of lack of penetration can be seen along portions of the chirp profiles of Transects #1A, 1, 2, 3, 6, 7, 8, 9, 10, 12, 13, 14, and 15 as shown in Figures 143-146, 149-153, and 155-158, respectively. In the GIS data set that accompanies this report, the chirp tracklines where no bottom penetration occurred are delineated.

Between 70 and 75 percent of the region surveyed with the chirp system, approximately 60 out of the 85 miles of trackline along the Lower Passaic River, was characterized by penetration into the sub-bottom to depths between 1 to 9 feet. In the GIS data set that accompanies this report, all of the sub-bottom reflections, including those occurring between 1 and 9 feet are outlined on the chirp profiles. Examples of shallow chirp reflections can be seen along portions of the chirp profiles of all of the Transects #1A-15 and the chirp profiles along deep cores DC16-B and DC16 as shown in Figures 143 and 160, respectively.

As documented in the shallow and deep cores, the predominant sediment type was silt and the major variations in the sediments were the amount of silt relative to clays, sands, and gravels. This variation in the silts could be correlated with some of the chirp sub-bottom reflections that were observed.

Of the shallow (<2 feet) chirp reflection events, the occurrence of "soft" silts overlying either firmer/tighter silts or silts with fine sands was one of the most pronounced events observed. In the chirp profiles shown as examples, this can be seen in Transect #1A near deep core DC1A-A, Transect #1 along cores DC1-A and DC1-C, Transect #2 near core DC2-C, Transect #3 at cores DC3-A and DC3-C, and in the southern portion of Transect #5 (Figures 143-146, and 148). The softer silt is characterized by a low amplitude bottom reflection that is underlain by a higher amplitude return that is associated with the change in sediment type to the firmer sediments.

In other locations, chirp reflections were observed when other variations occurred in the silt layers. For example at deep core DC1C along Transect 1, a chirp reflection can be traced across the east portion of the profile that correlates with the change from overlying elastic silt with fine- to medium-sand to a poorly graded silt with sand that is observed at a depth of 9.3 feet in the core (Figure 144).

Chirp sub-bottom reflections can also be correlated with changes from silts to sands and from sands to gravels as documented by the deep cores. At deep core DC3-A along Transect #3, DC4-B along Transect #4, and at DC5-C along Transect #5, silts are underlain by sands with corresponding chirp reflections at depths of 14 feet, 2.6 feet, and 1 feet, respectively (Figures 146-148). Along Transect 8 at deep core DC8-C, a chirp reflection can be correlated with a change from overlying fine sand to underlying gravel with fine-medium sand at a depth of 2.4 feet beneath the river bottom (Figure 151).

The predominance of silts with varying amounts of sands, clays, and gravels meant that there was not a great deal of variability in acoustic impedance in the sub-bottom sediments. This in turn, limited the occurrence of high-amplitude chirp reflections that could be used to delineate significant changes in sediment types. This was further exacerbated by the fact that in this riverine environment changes in sediment types are sometimes gradational rather than discrete and thus large changes in acoustic impedance were not generated.

The variability and lack of continuity of the chirp reflections over even the relatively short distances (50 feet to 200 feet) between the deep cores along individual transects prevents the generation of geologic cross-sections based on the chirp data. The use of the chirp profiles to constrain the sub-bottom sediments beneath the river is further hampered by the fact that, with the exception of the Kearney Point Reach near Transect #1A, deeper reflection events were not penetrated by the deep cores. Thus, these reflection events cannot be "ground-truthed" by correlation with observed variations in sediments.

The utility of using the chirp sub-bottom profiles to identify sub-bottom sediments is limited. The best use of the chirp data in subsequent studies would be to use it as an identifier of variability in sub-bottom sediment type. This variability, and thus identification of the sediment layers present, would have to be independently verified by coring. In the GIS data set, areas where sub-bottom reflections of more than 6 feet and that were continuous over horizontal distances of at least 20 feet are identified. It is these reflections that mark the position of potential changes in sub-bottom sediments along the river.

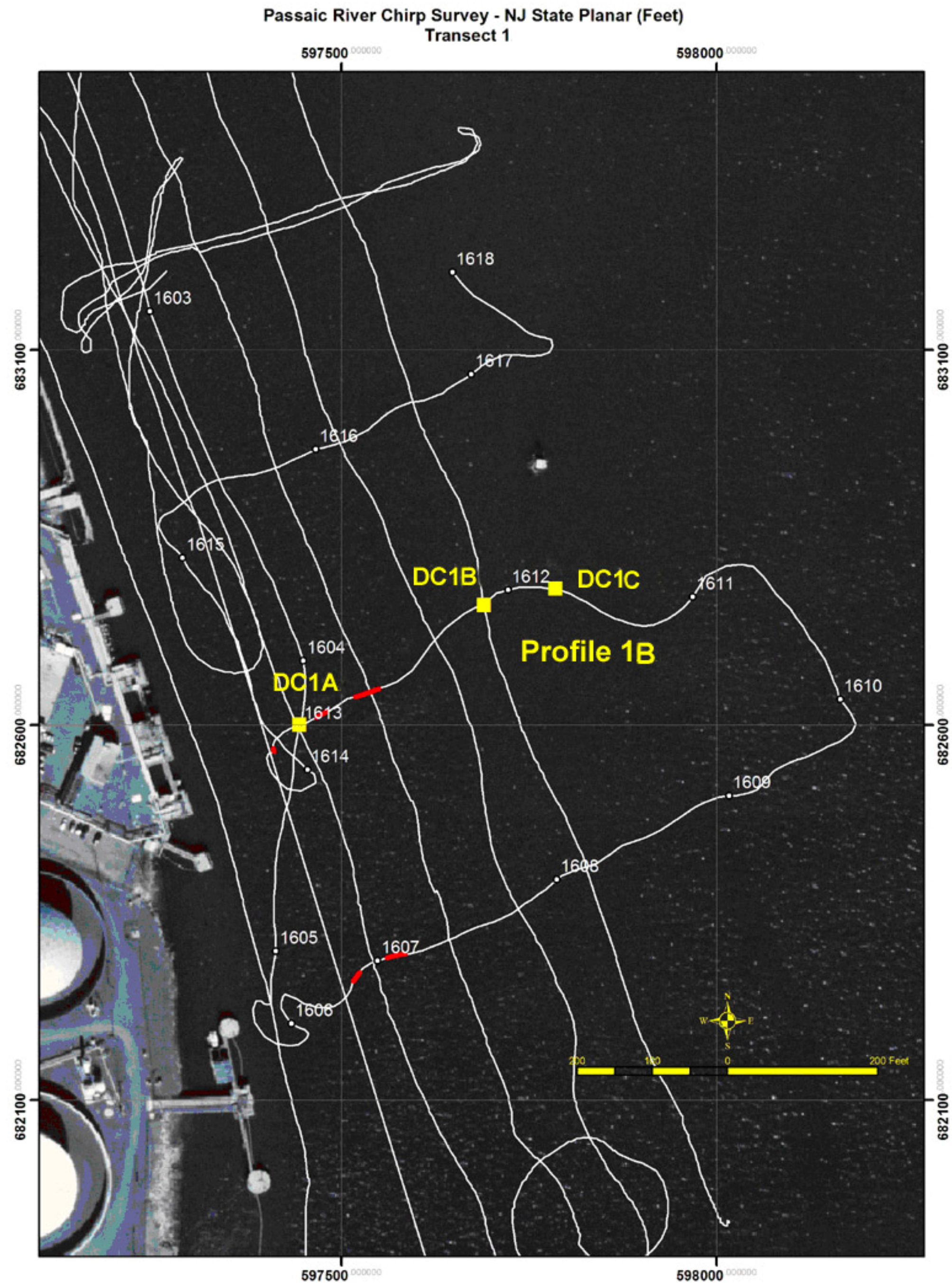


Figure 126. Location map for sub-bottom transect area 1. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

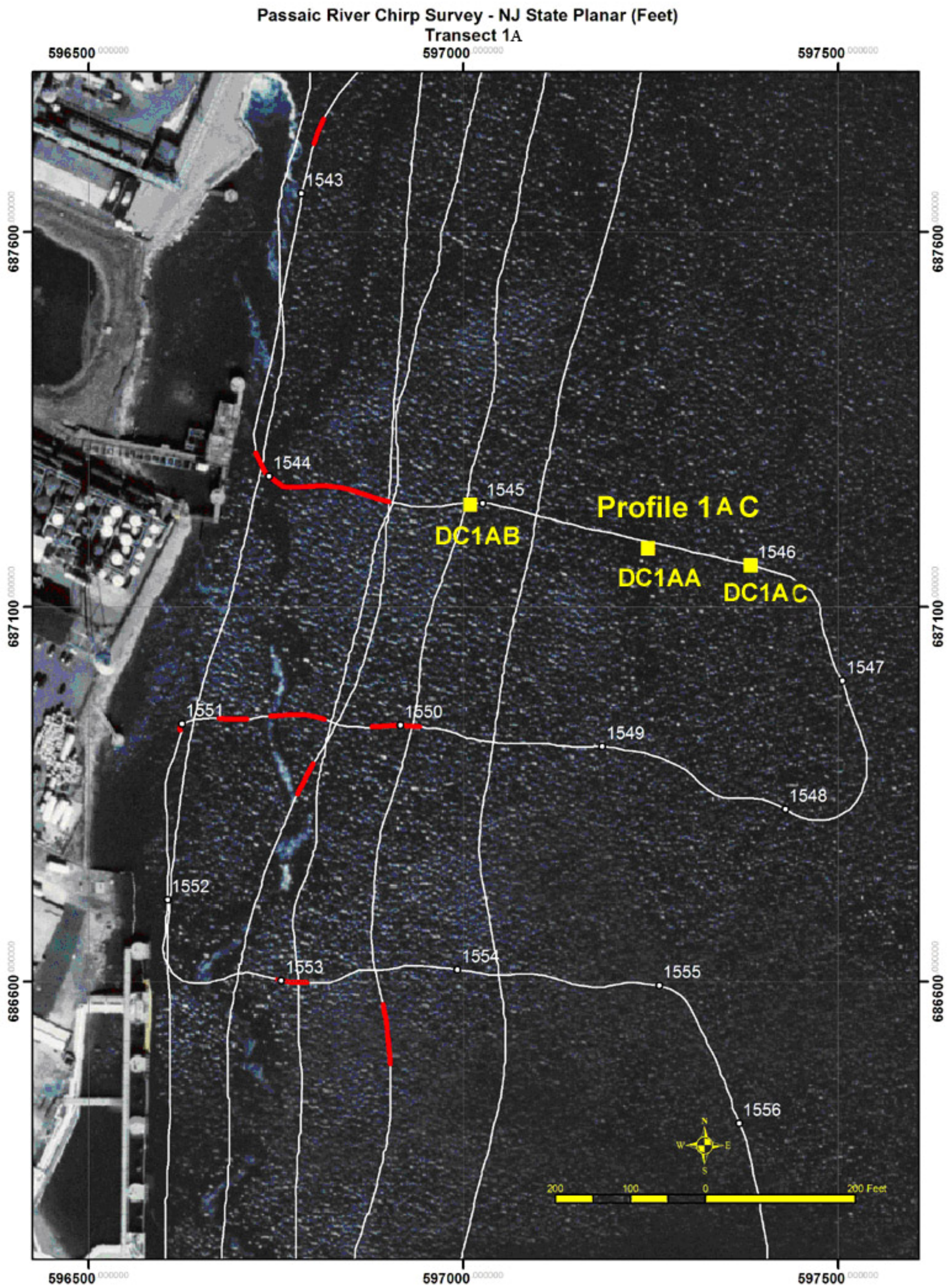


Figure 127. Location map for sub-bottom transect area 1A. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

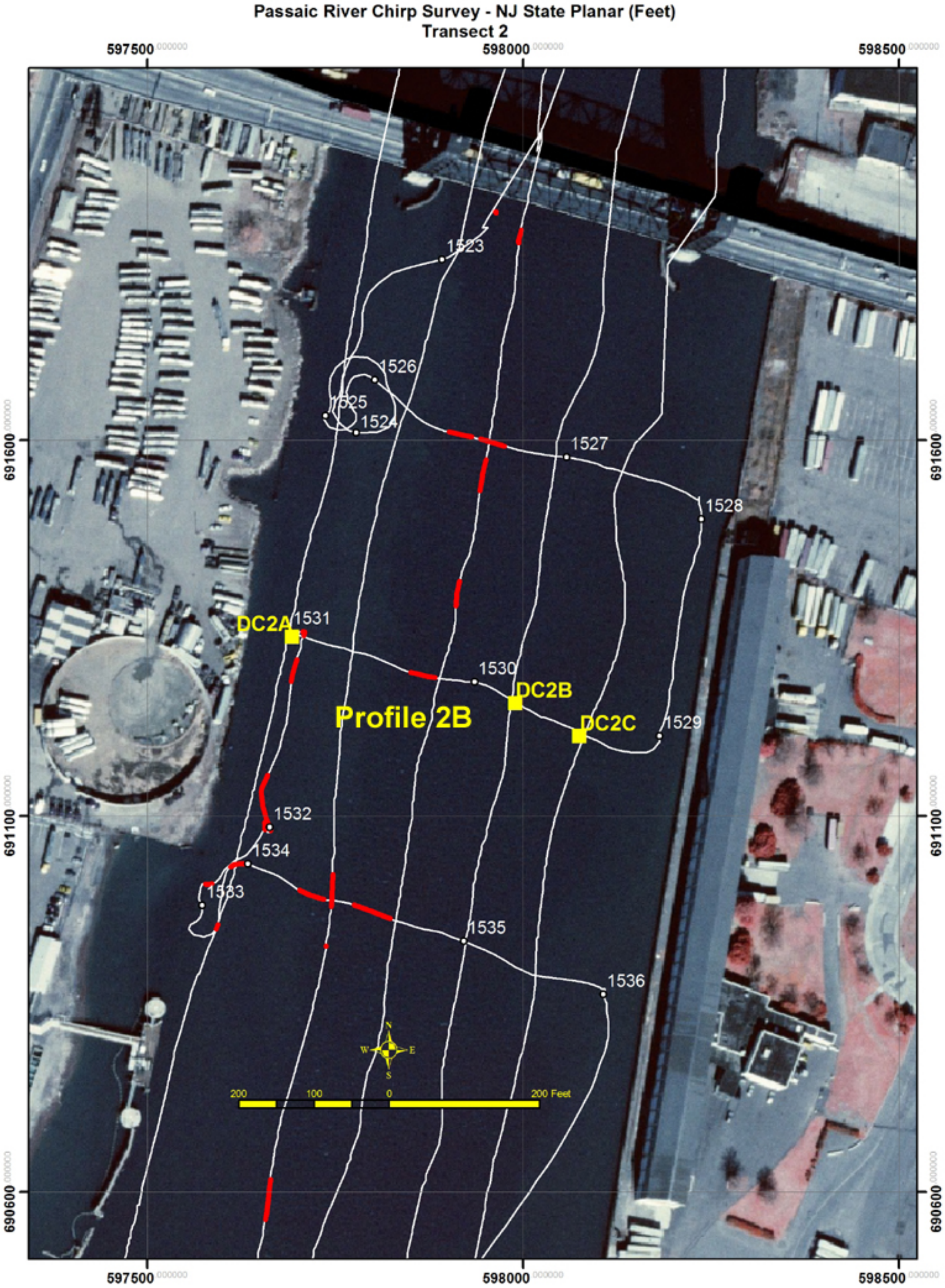


Figure 128. Location map for sub-bottom transect area 2. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

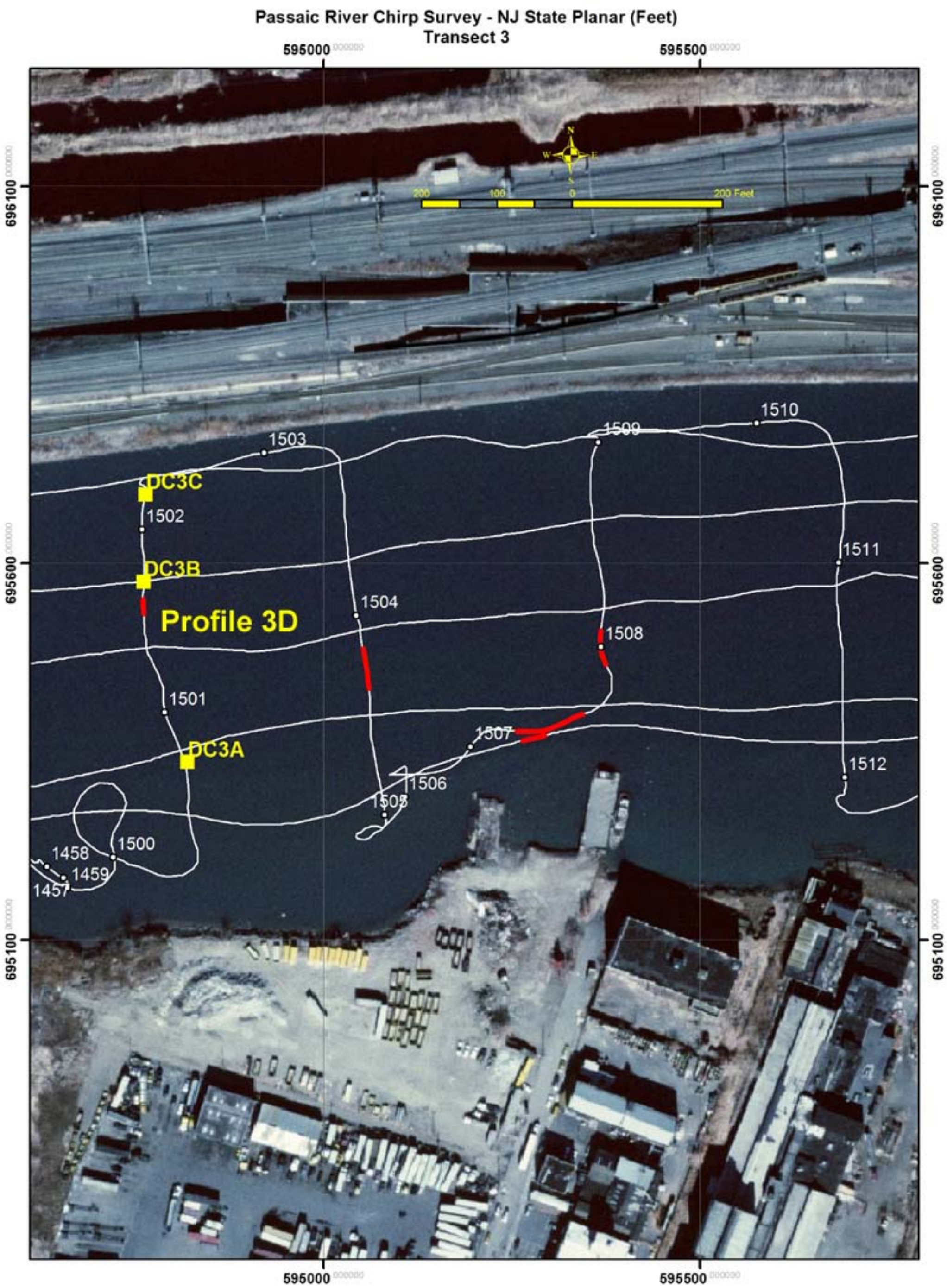


Figure 129. Location map for sub-bottom transect area 3. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

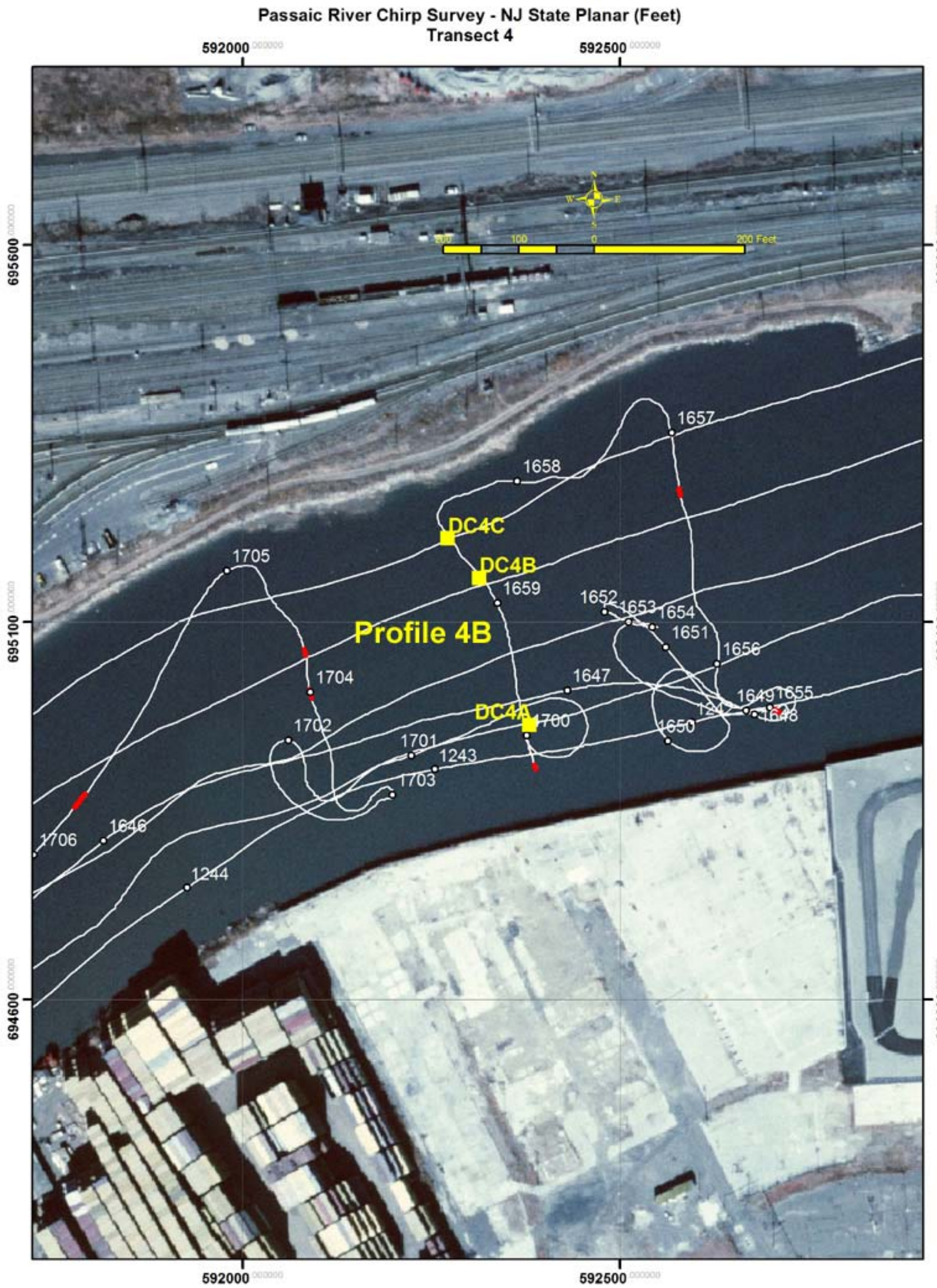


Figure 130. Location map for sub-bottom transect area 4. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

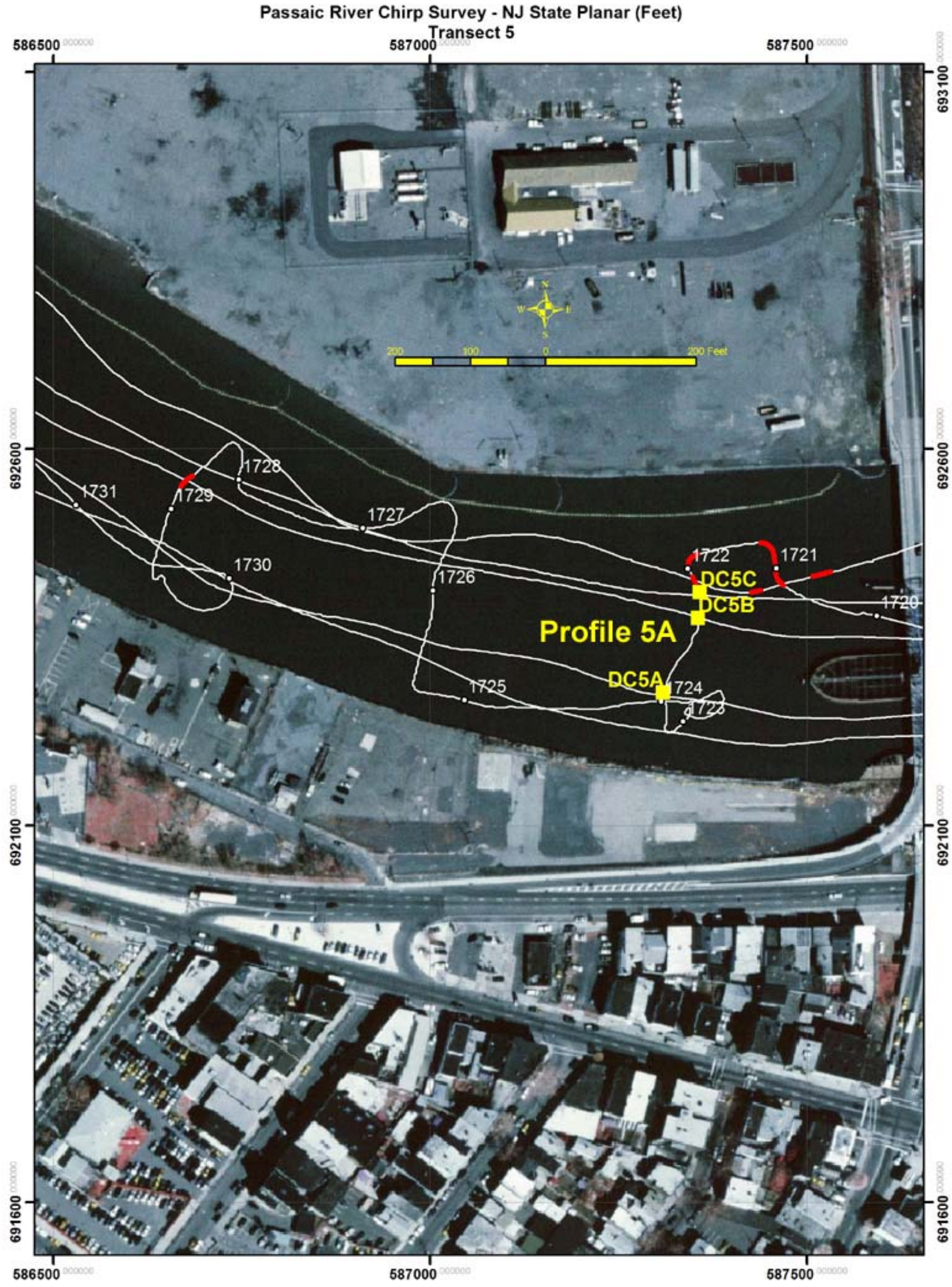


Figure 131. Location map for sub-bottom transect area 5. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

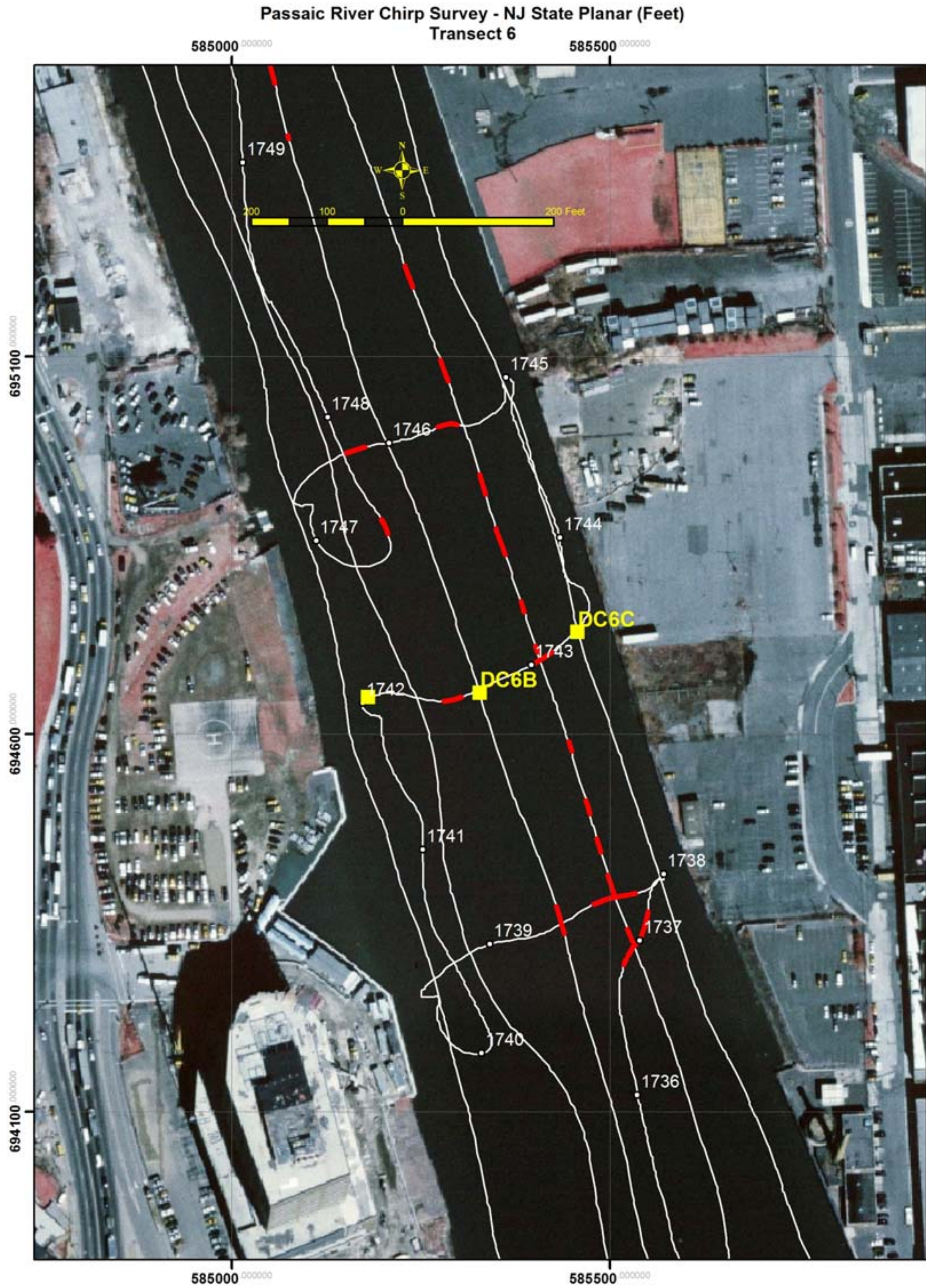


Figure 132. Location map for sub-bottom transect area 6. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

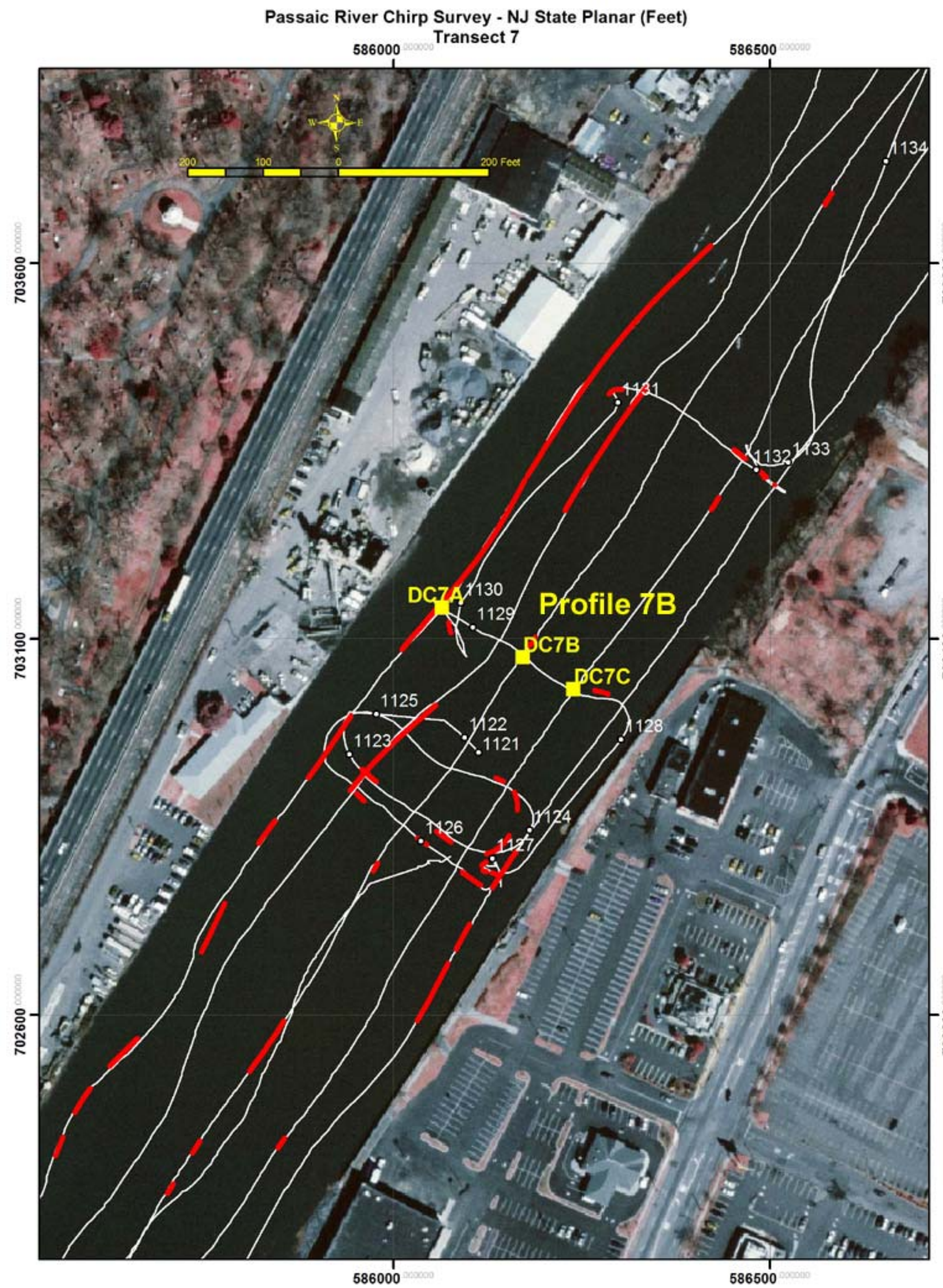


Figure 133. Location map for sub-bottom transect area 7. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

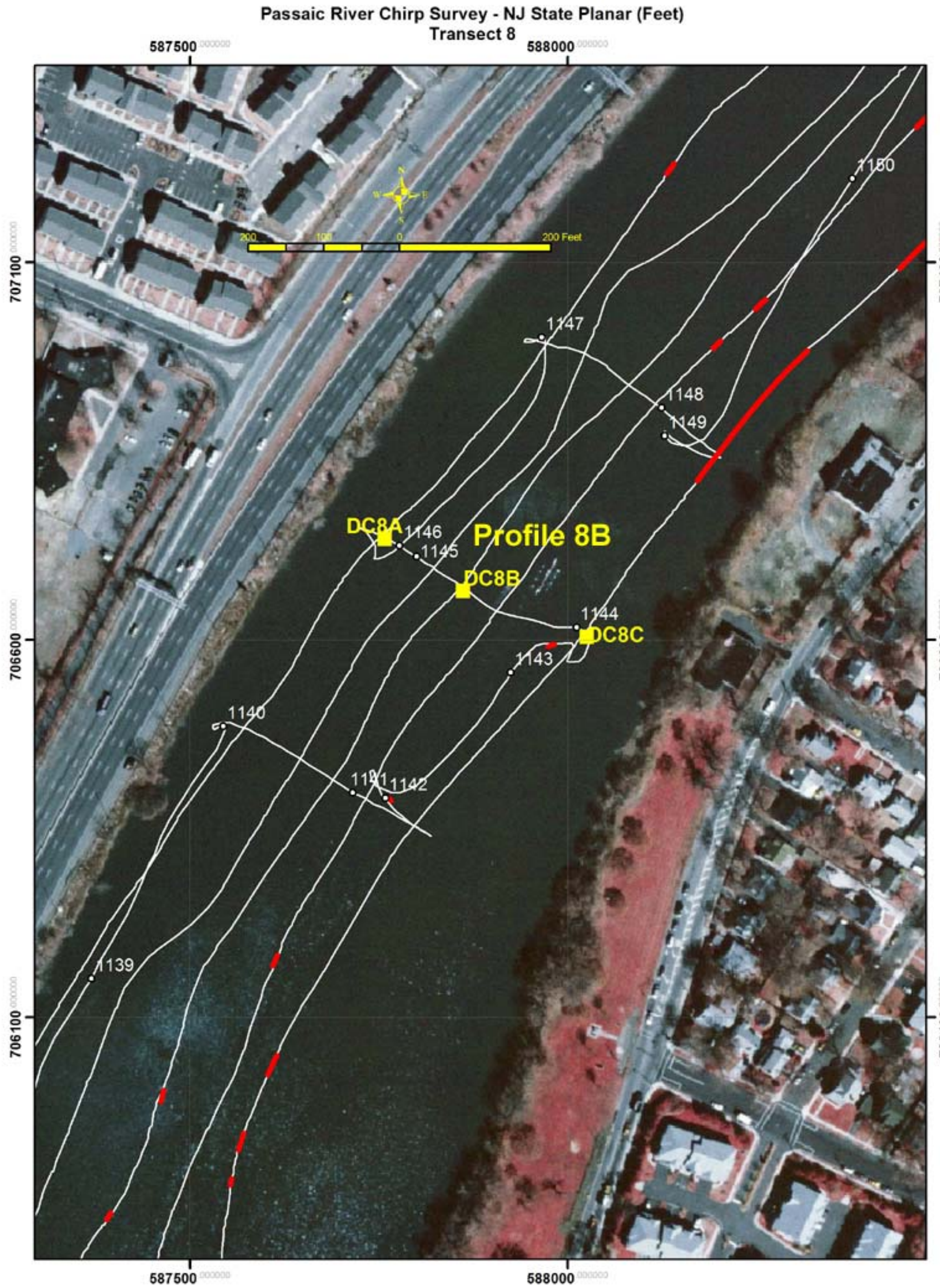


Figure 134. Location map for sub-bottom transect area 8. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

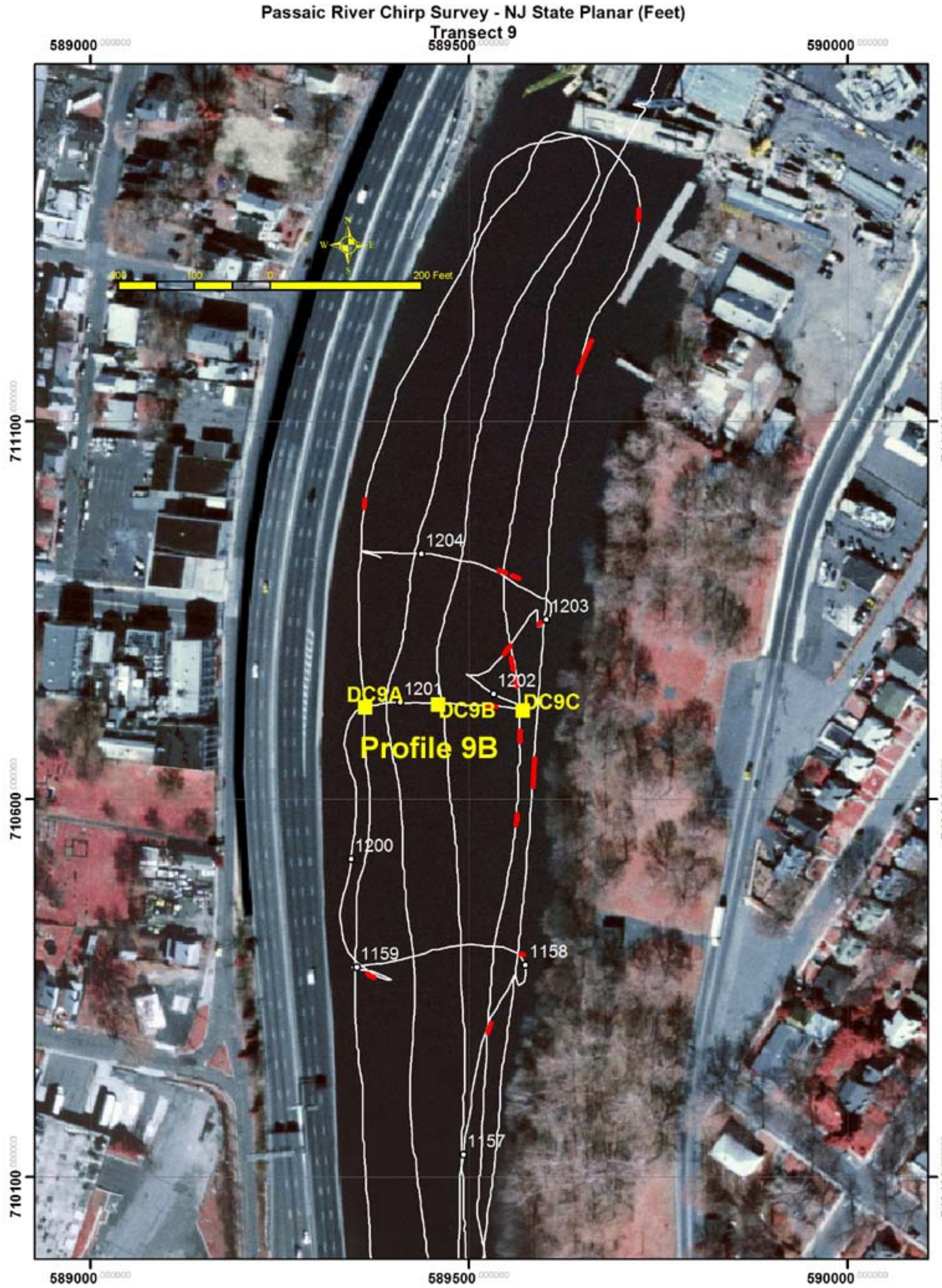


Figure 135. Location map for sub-bottom transect area 9. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

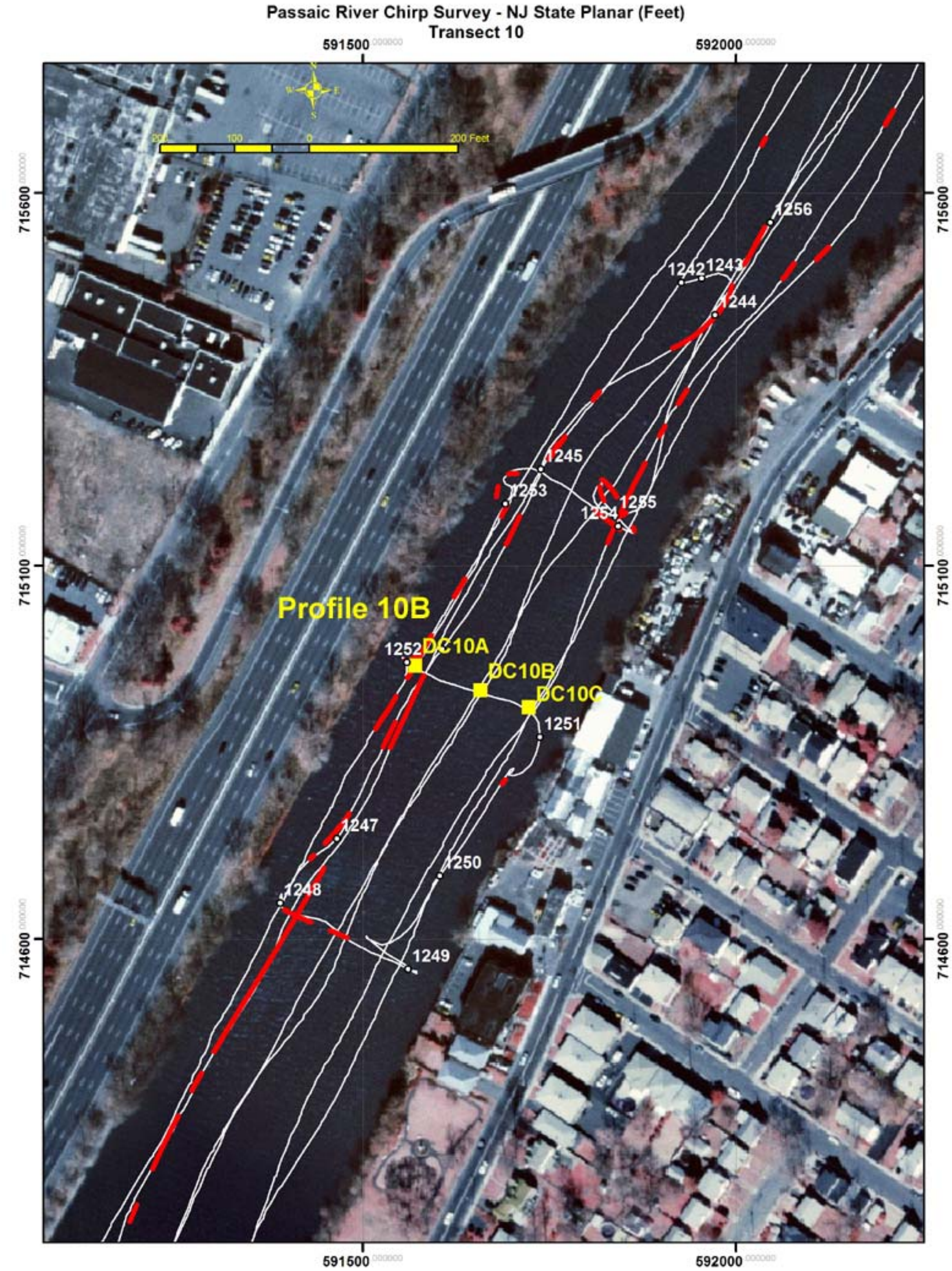


Figure 136. Location map for sub-bottom transect area 10. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

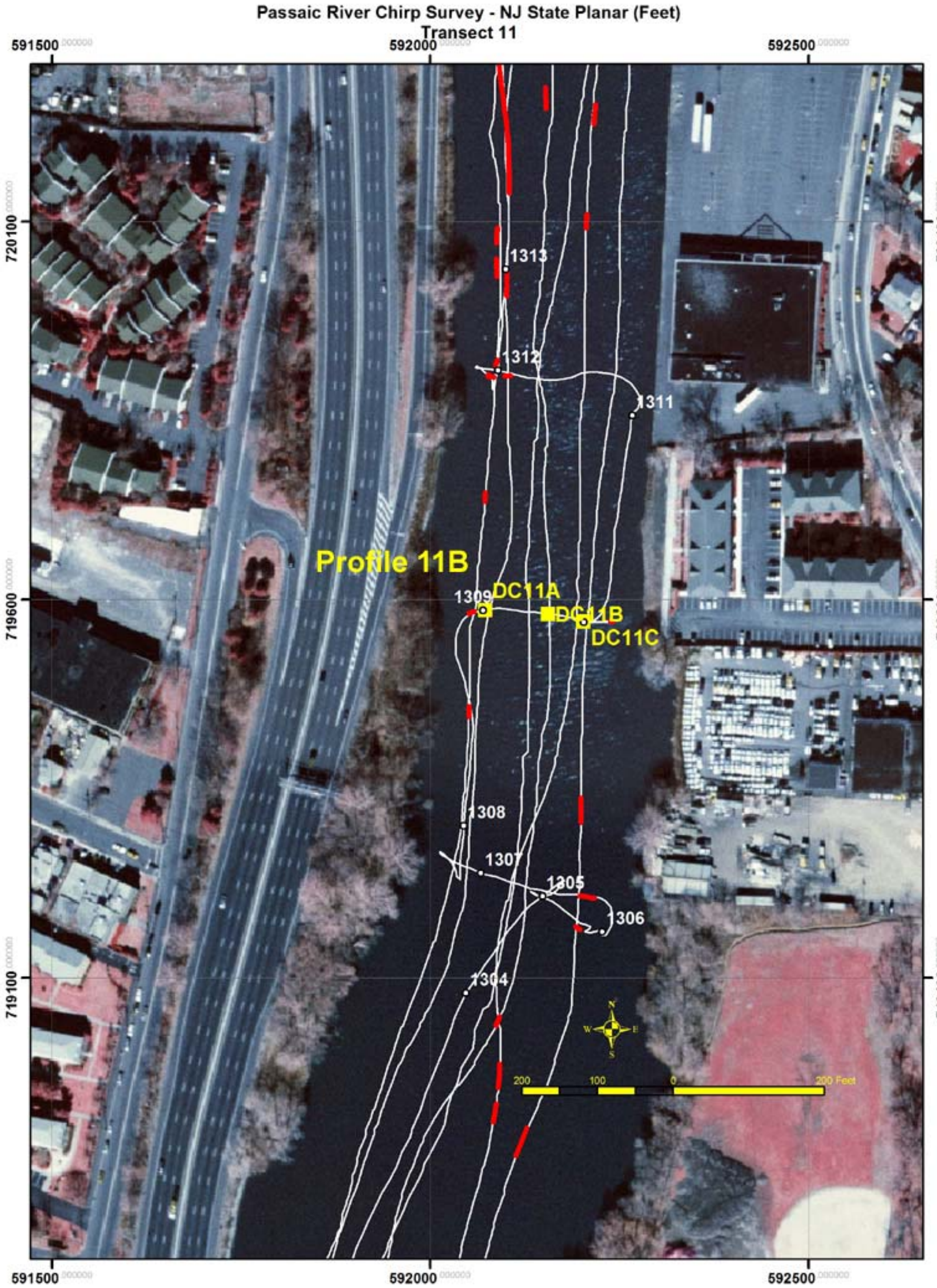


Figure 137. Location map for sub-bottom transect area 11. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

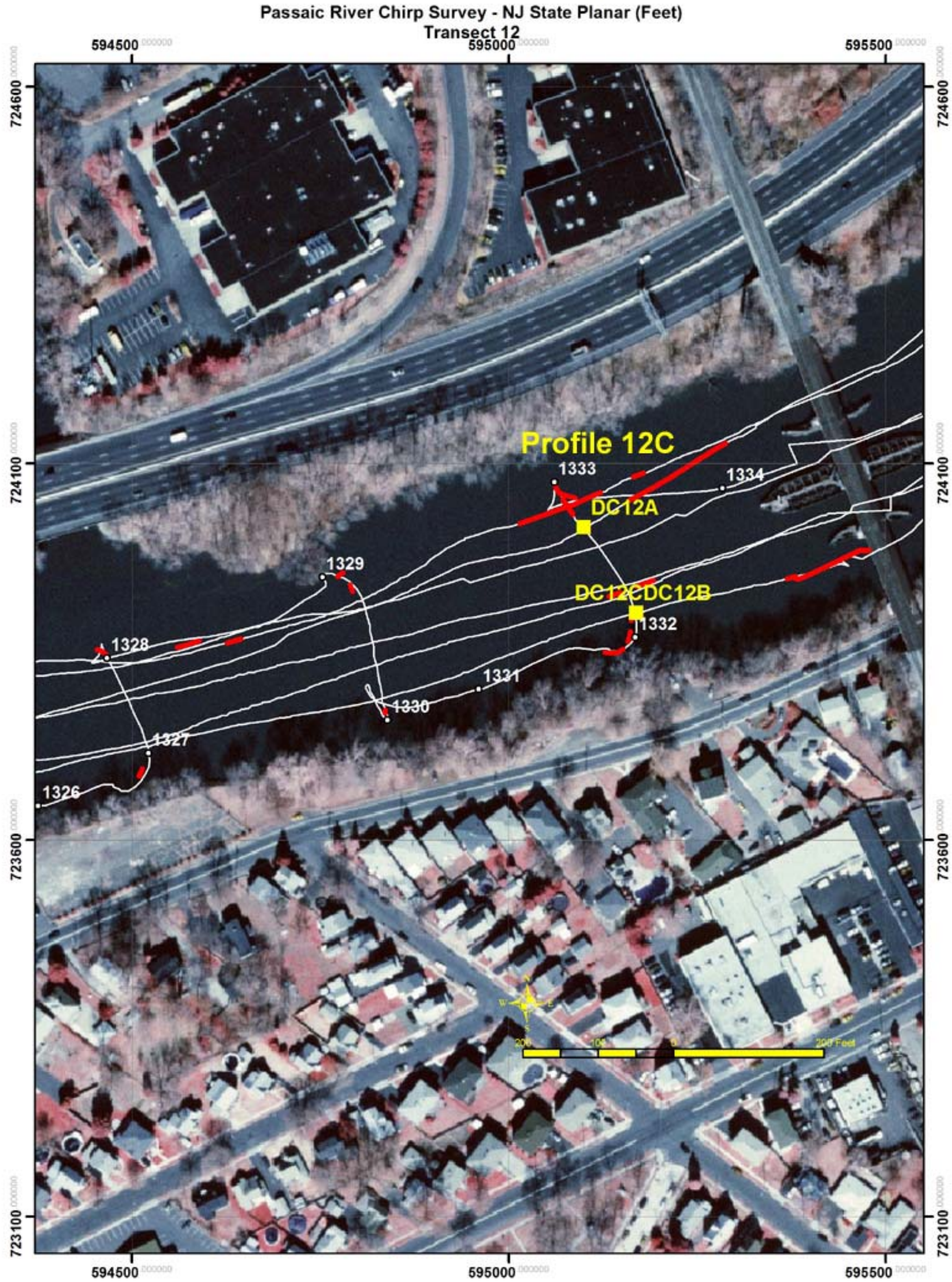


Figure 138. Location map for sub-bottom transect area 12. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

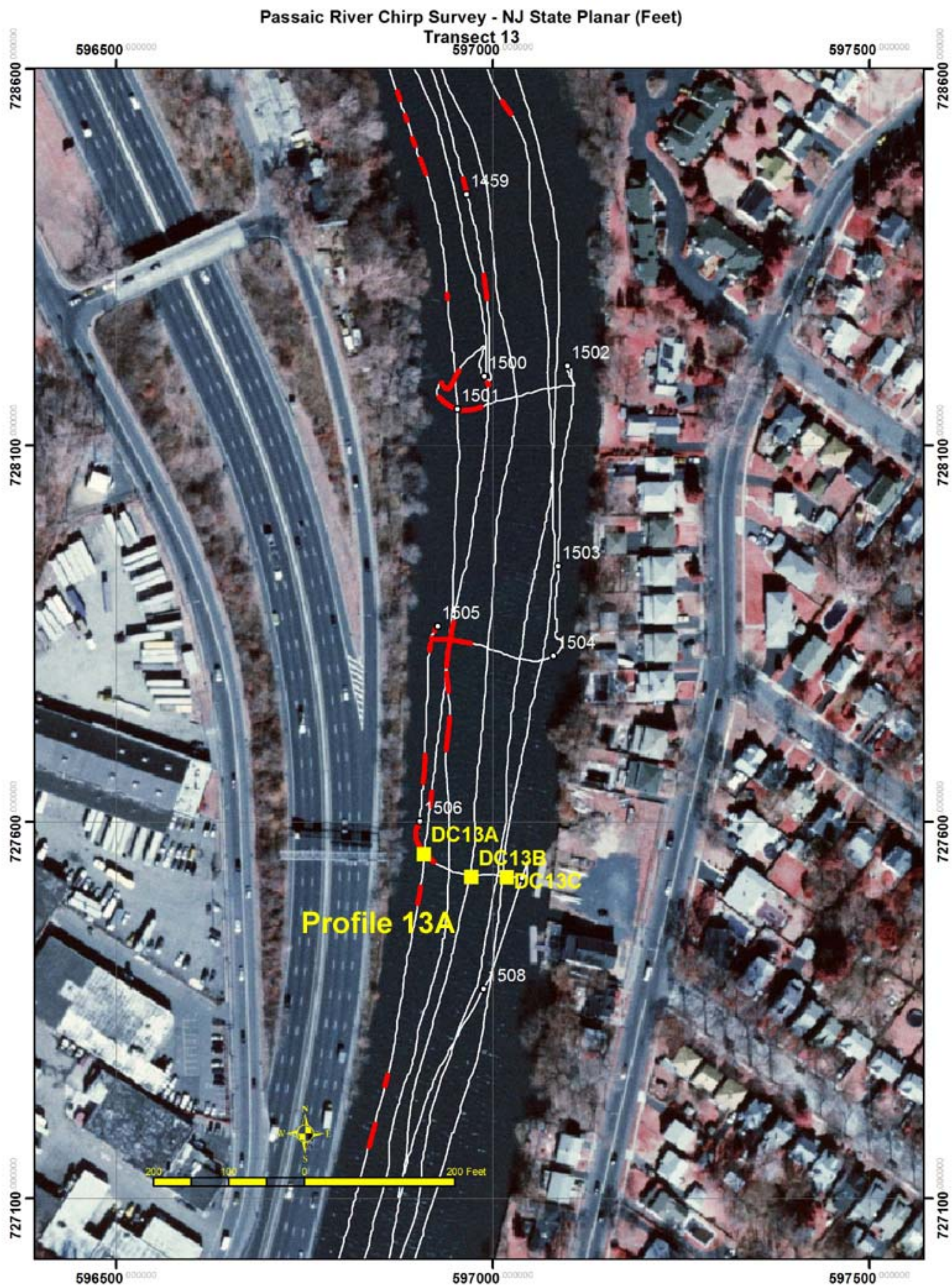


Figure 139. Location map for sub-bottom transect area 13. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

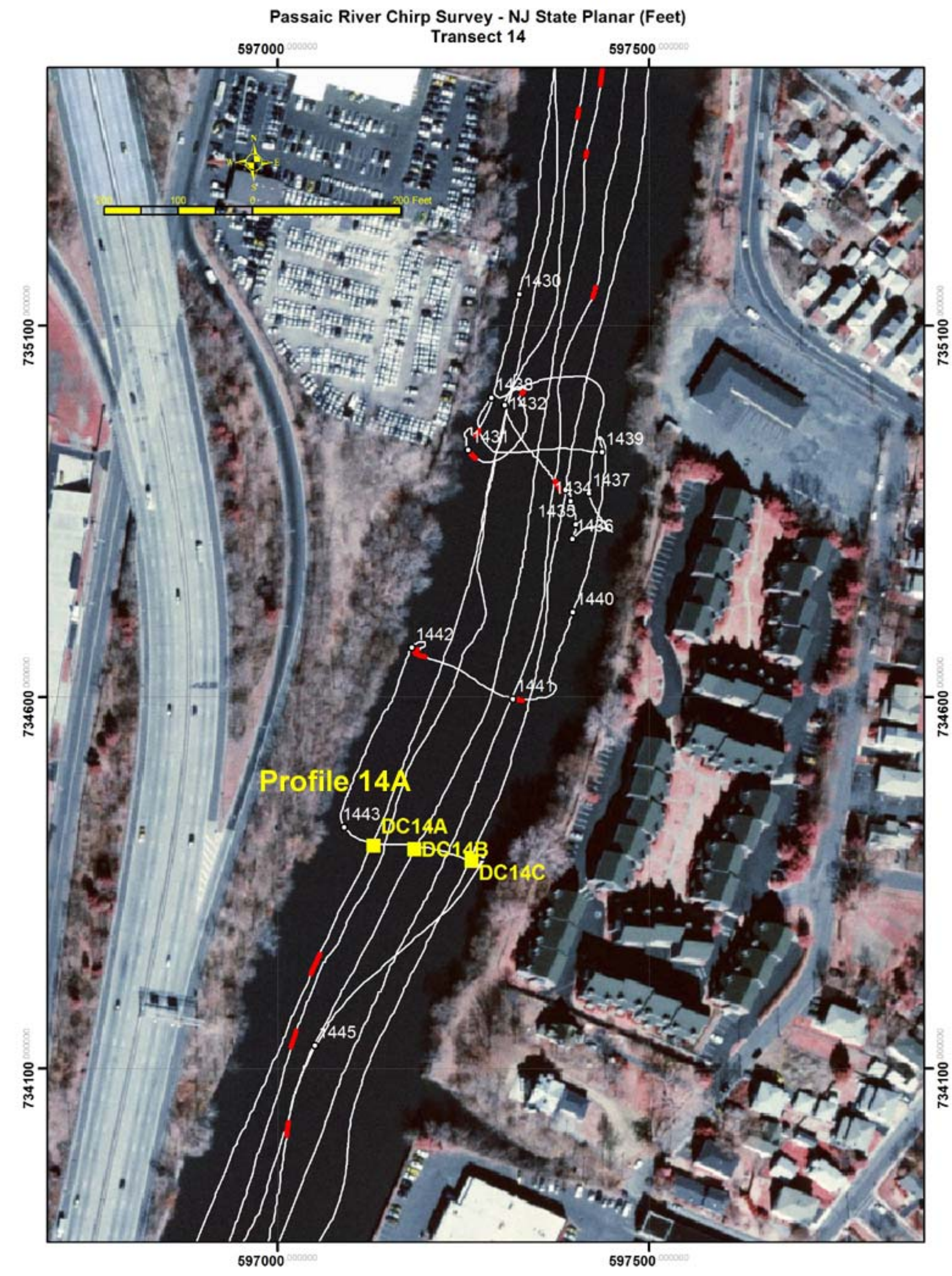


Figure 140. Location map for sub-bottom transect area 14. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

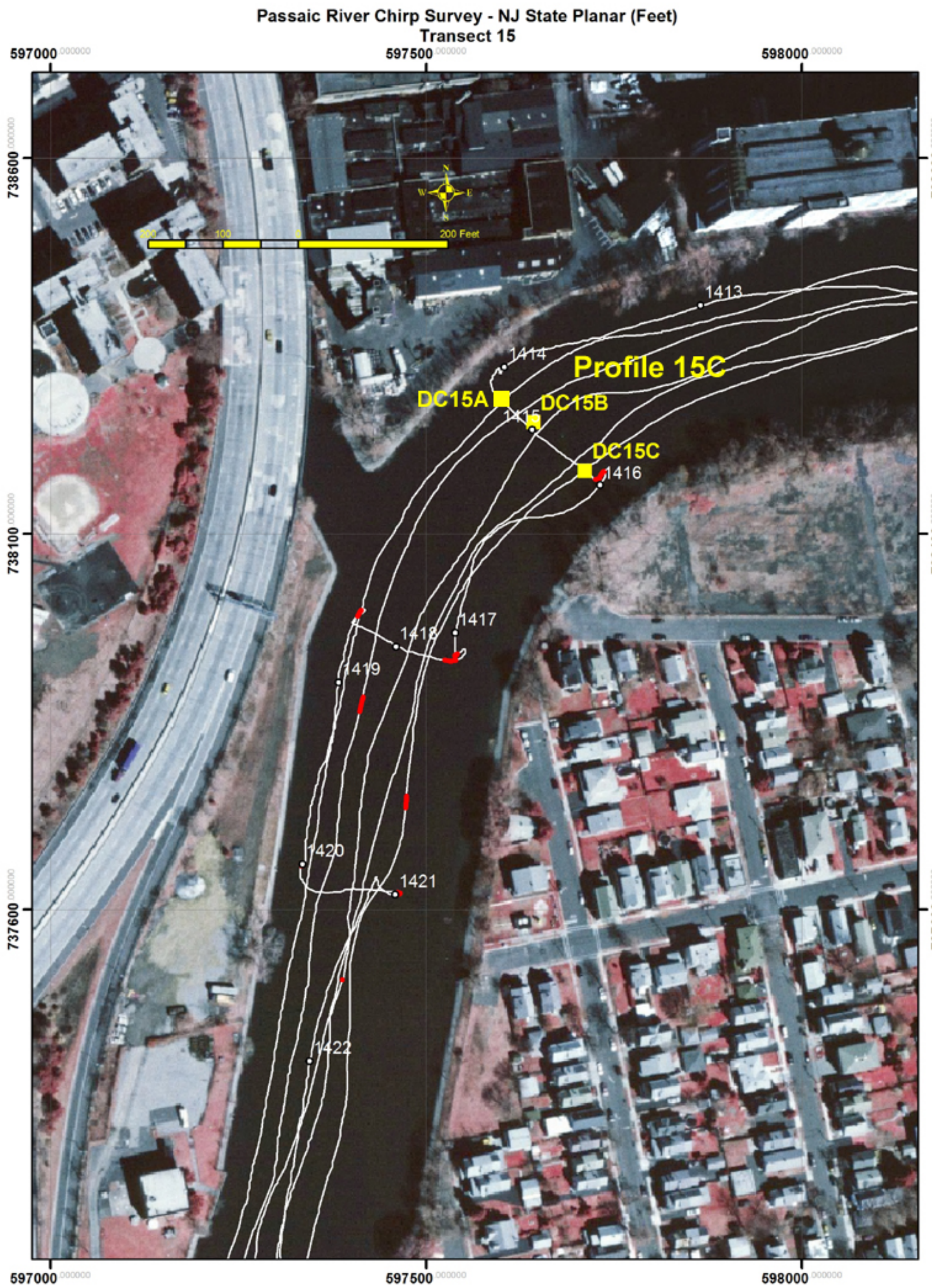


Figure 141. Location map for sub-bottom transect area 15. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

Passaic River Chirp Survey - NJ State Planar (Feet)
Transect 16

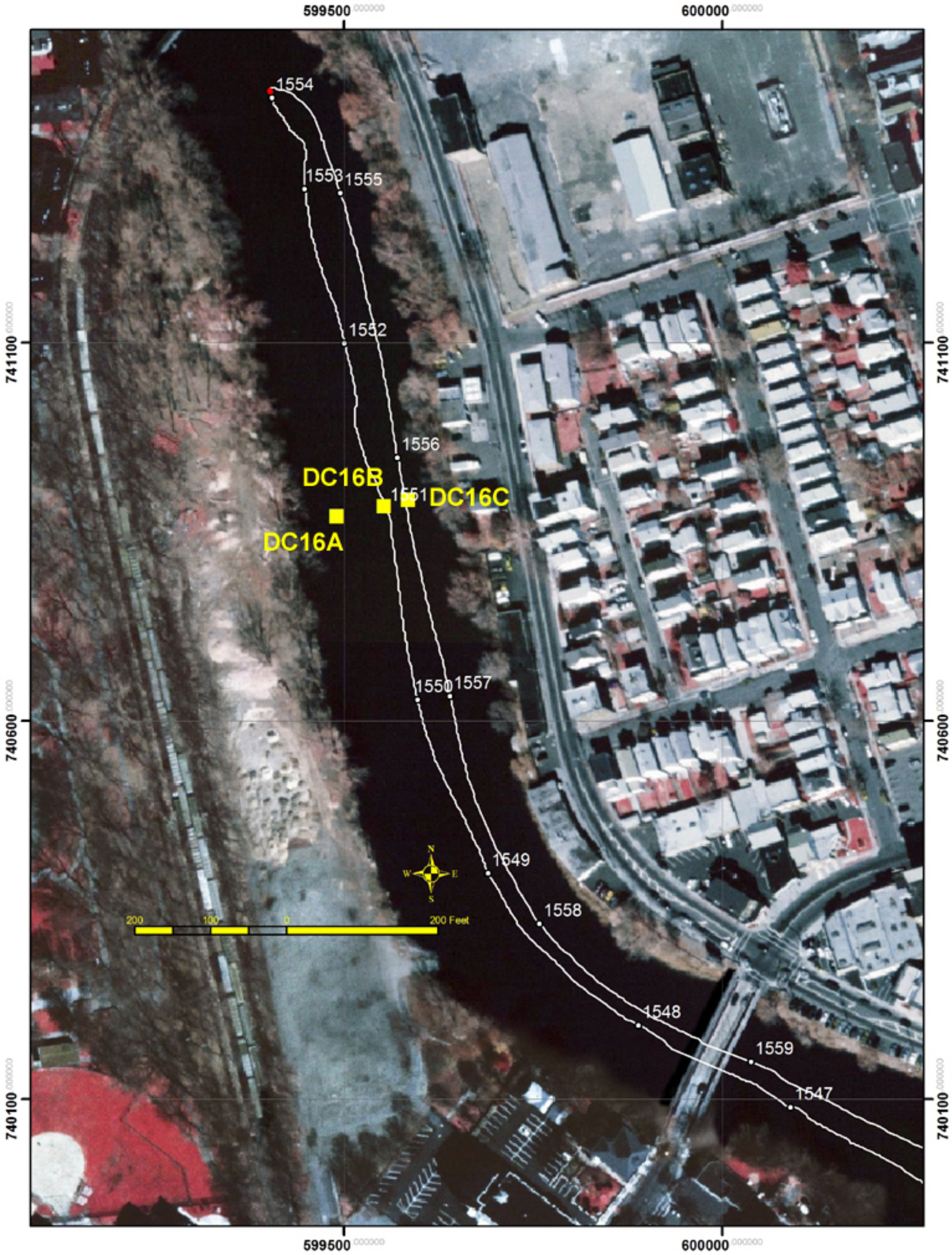


Figure 142. Location map for sub-bottom transect area 16. Coordinates are in NJ State Planar Feet. Thin white lines are chirp tracklines. Time (Greenwich Mean Time) along the cross-river tracklines are shown by small circles with labels. Locations of deep cores (vibracores) are shown by small squares with labels. Thicker red lines denote locations where no sub-bottom penetration occurred using the chirp system. General location for this transect is shown in Figure 125.

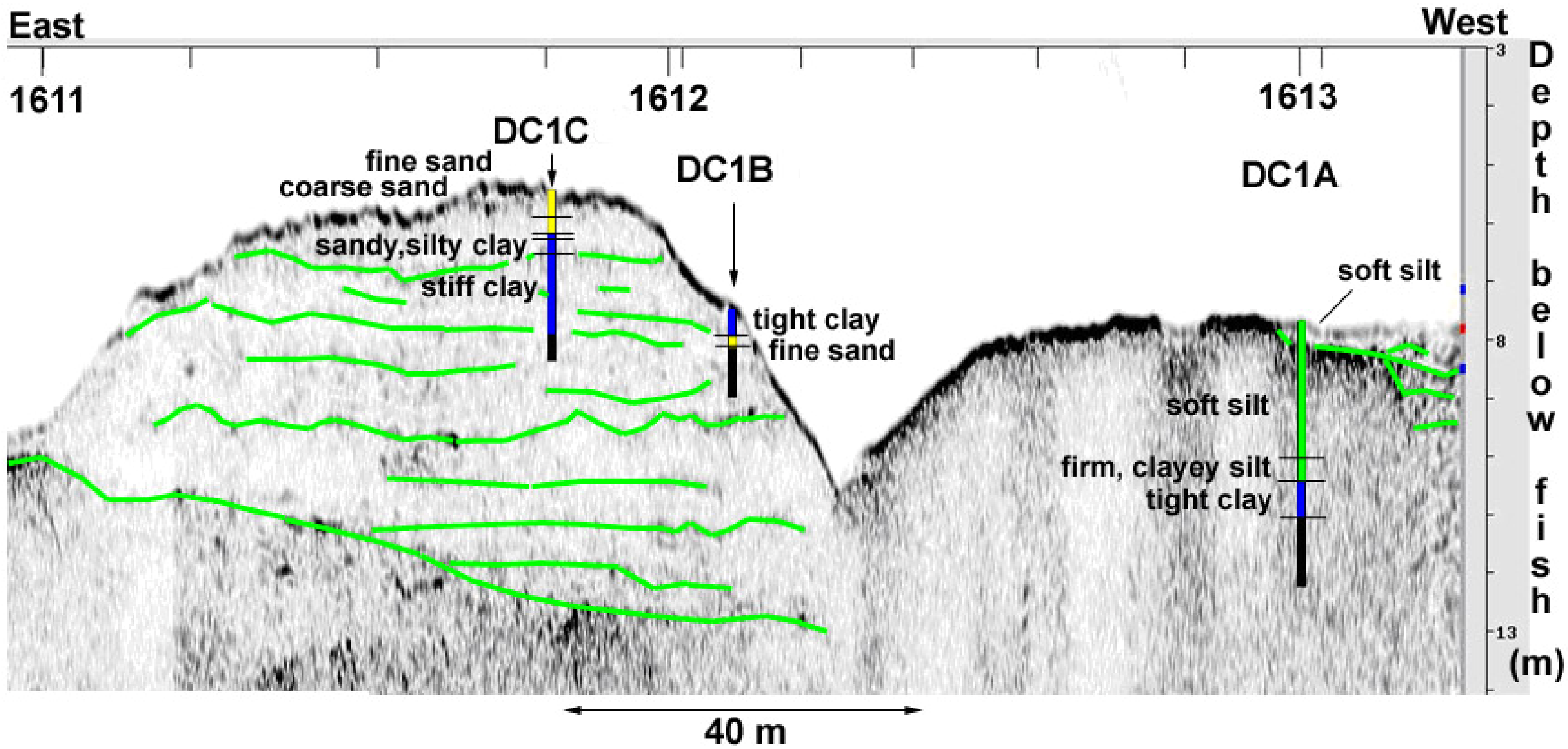


Figure 143. Chirp sub-bottom profile (Profile 1B) along Transect 1. Shown are deep cores DC1A, DC1B, and DC1C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 126. 1611 to 1613 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

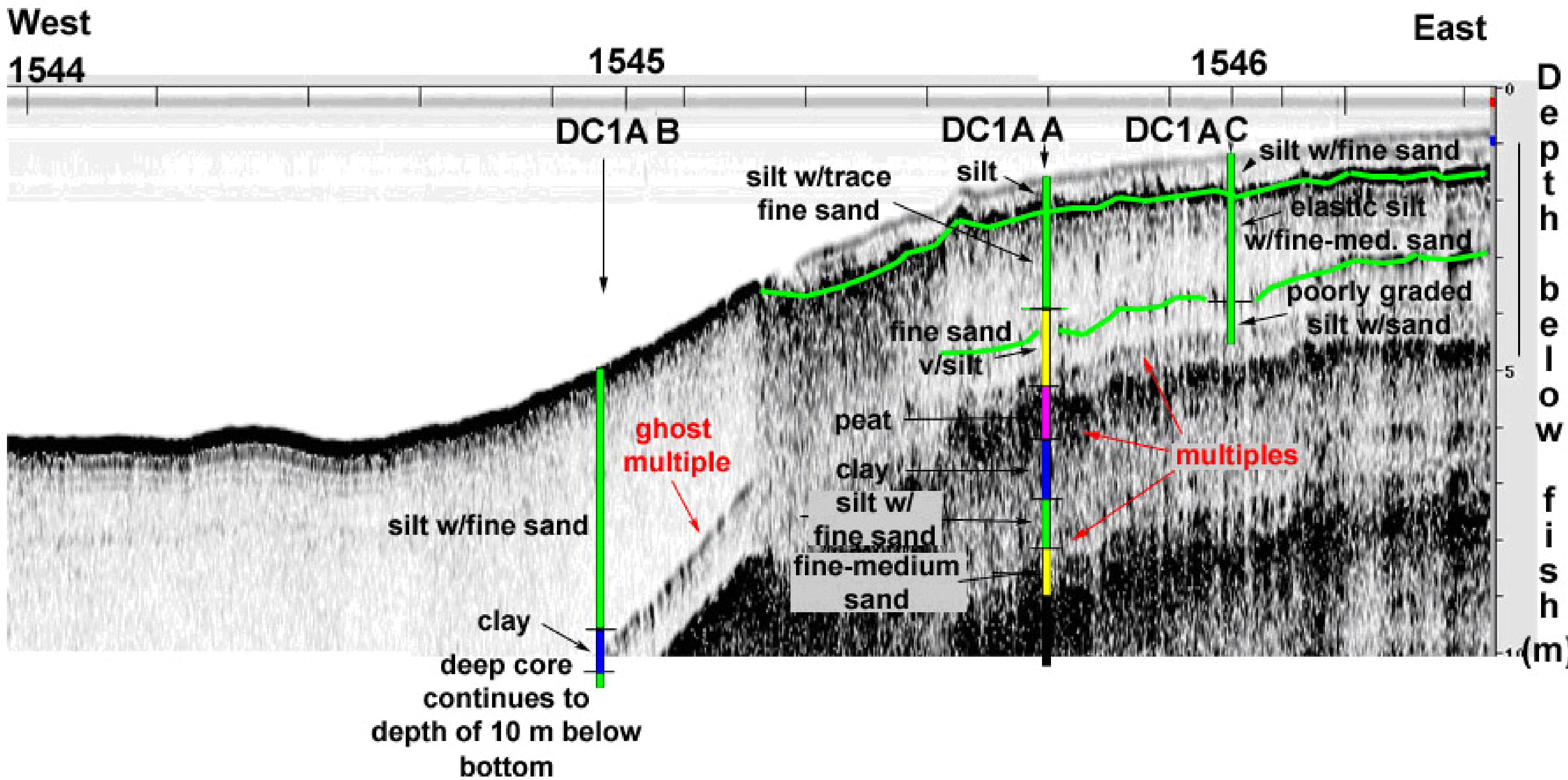


Figure 144. Chirp sub-bottom profile (Profile 1AC) along Transect 1A. Shown are deep cores DC1AA, DC1AB, and DC1AC. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 127. 1544 to 1546 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

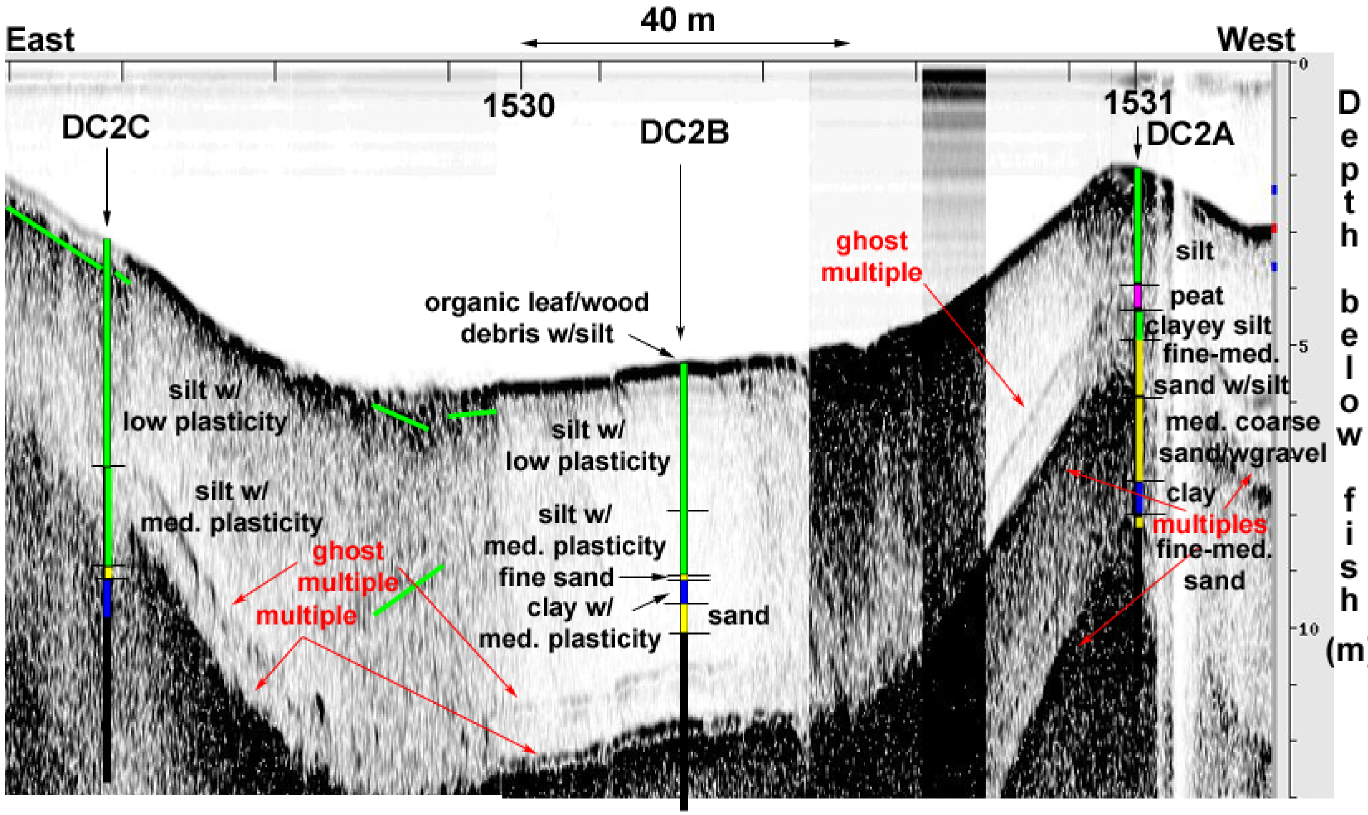


Figure 145. Chirp sub-bottom profile (Profile 2B) along Transect 2. Shown are deep cores DC2A, DC2B, and DC2C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 128. 1530 and 1531 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

R2-0007433

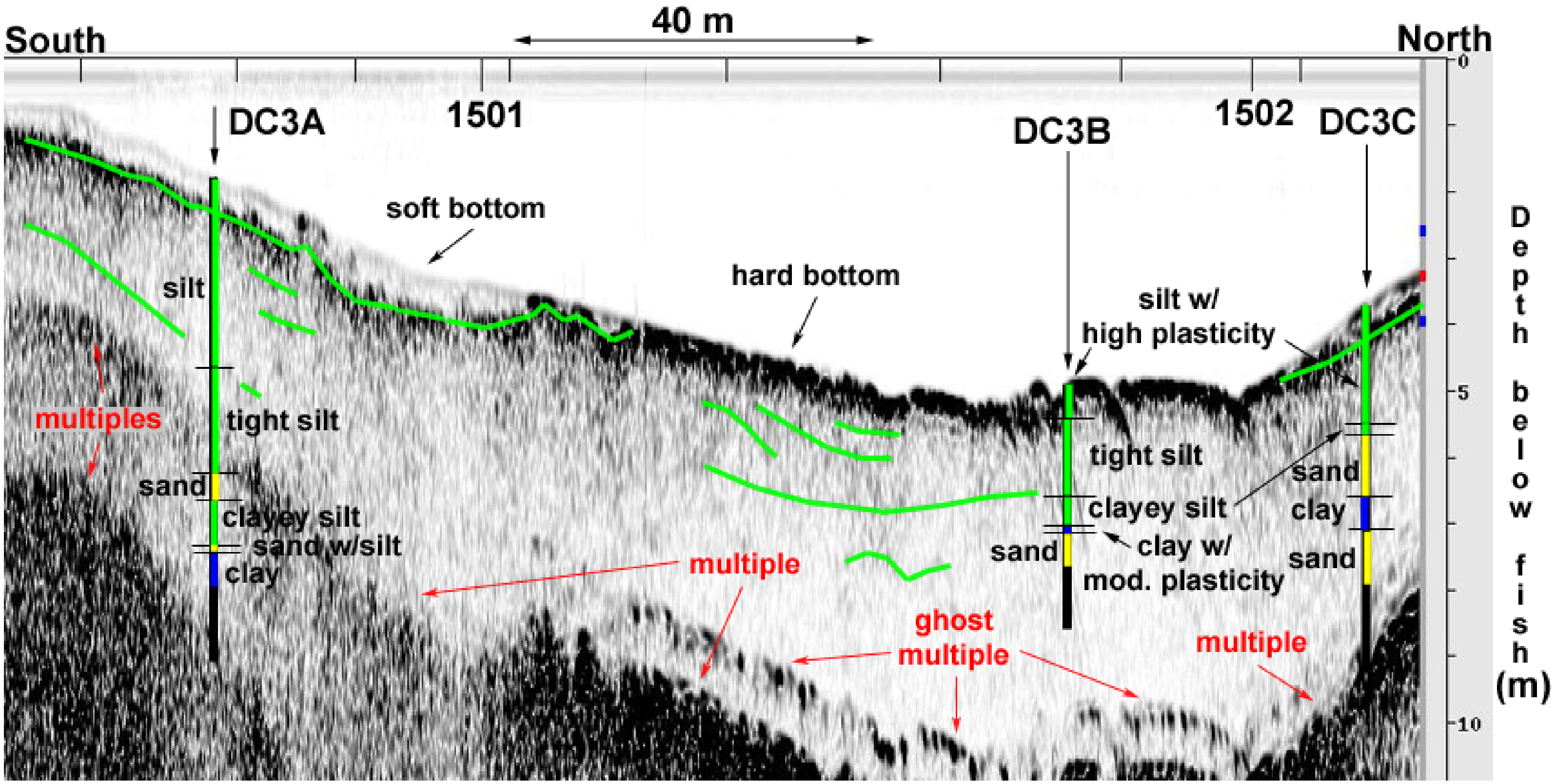


Figure 146. Chirp sub-bottom profile (Profile 3D) along Transect 3. Shown are deep cores DC3A, DC3B, and DC3C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 129. 1501 and 1502 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

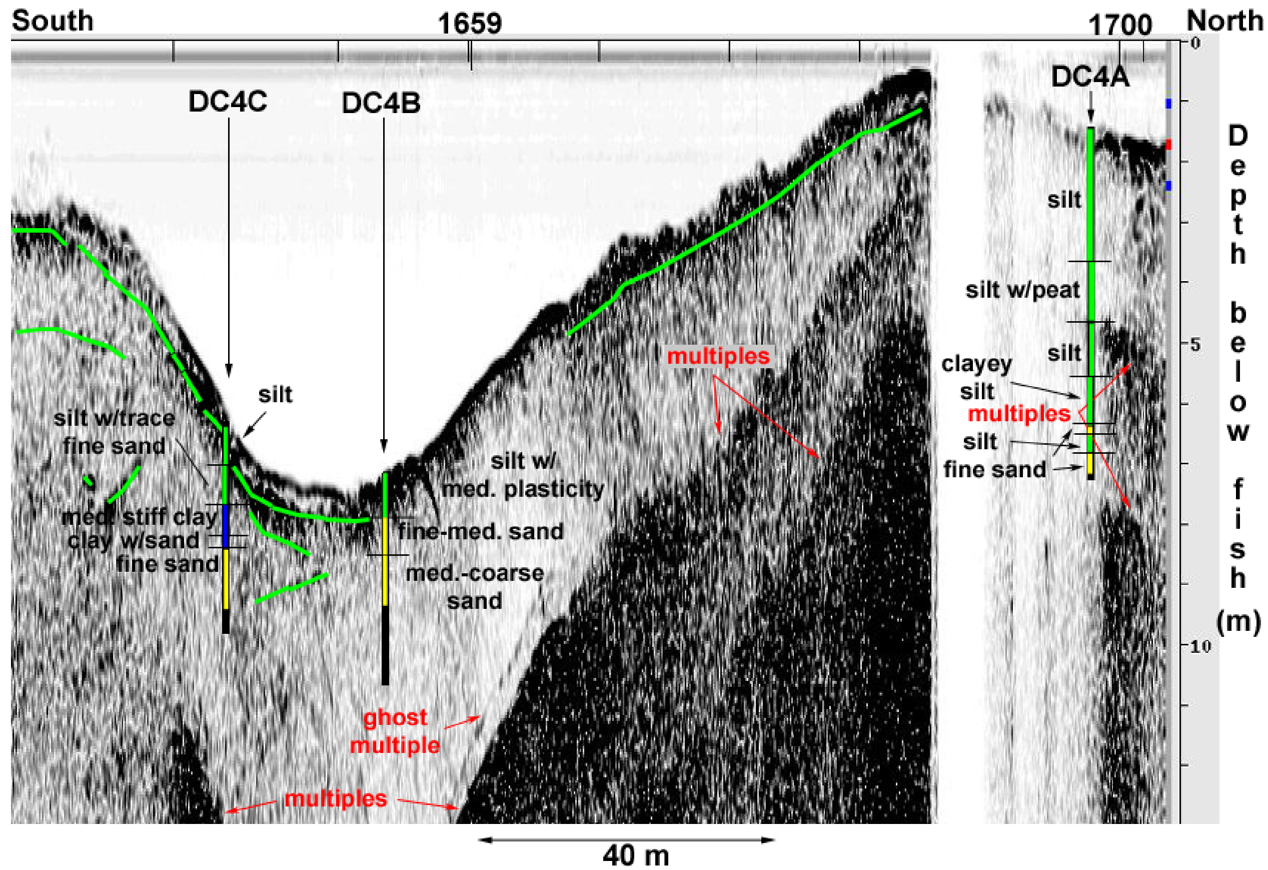


Figure 147. Chirp sub-bottom profile (Profile 4B) along Transect 4. Shown are deep cores DC4A, DC4B, and DC4C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 130. 1659 and 1700 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

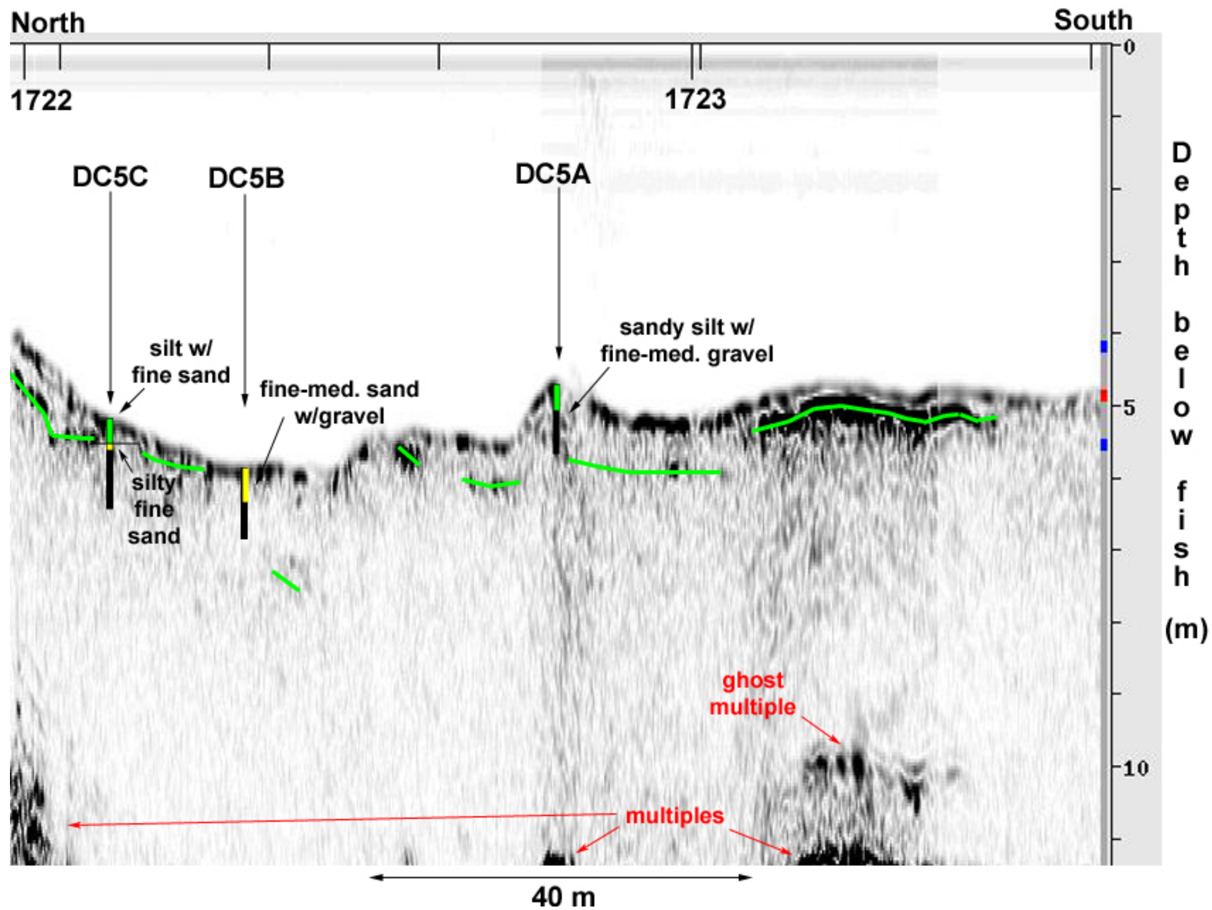


Figure 148. Chirp sub-bottom profile (Profile 5A) along Transect 5. Shown are deep cores DC5A, DC5B, and DC5C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 131. 1722 and 1723 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

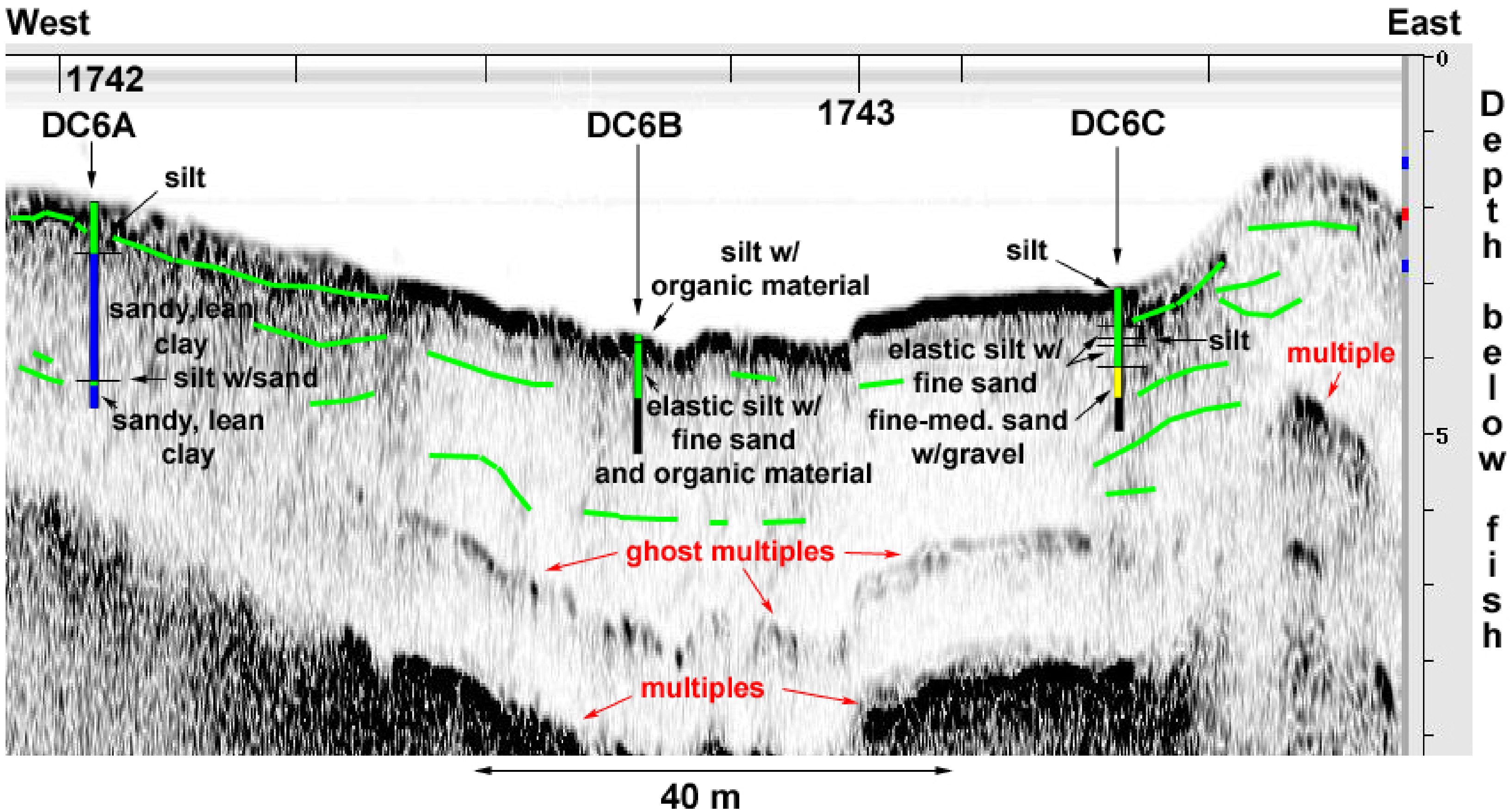


Figure 149. Chirp sub-bottom profile (Profile 6B) along Transect 6. Shown are deep cores DC6A, DC6B, and DC6C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 132. 1742 and 1743 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

R2-0007437

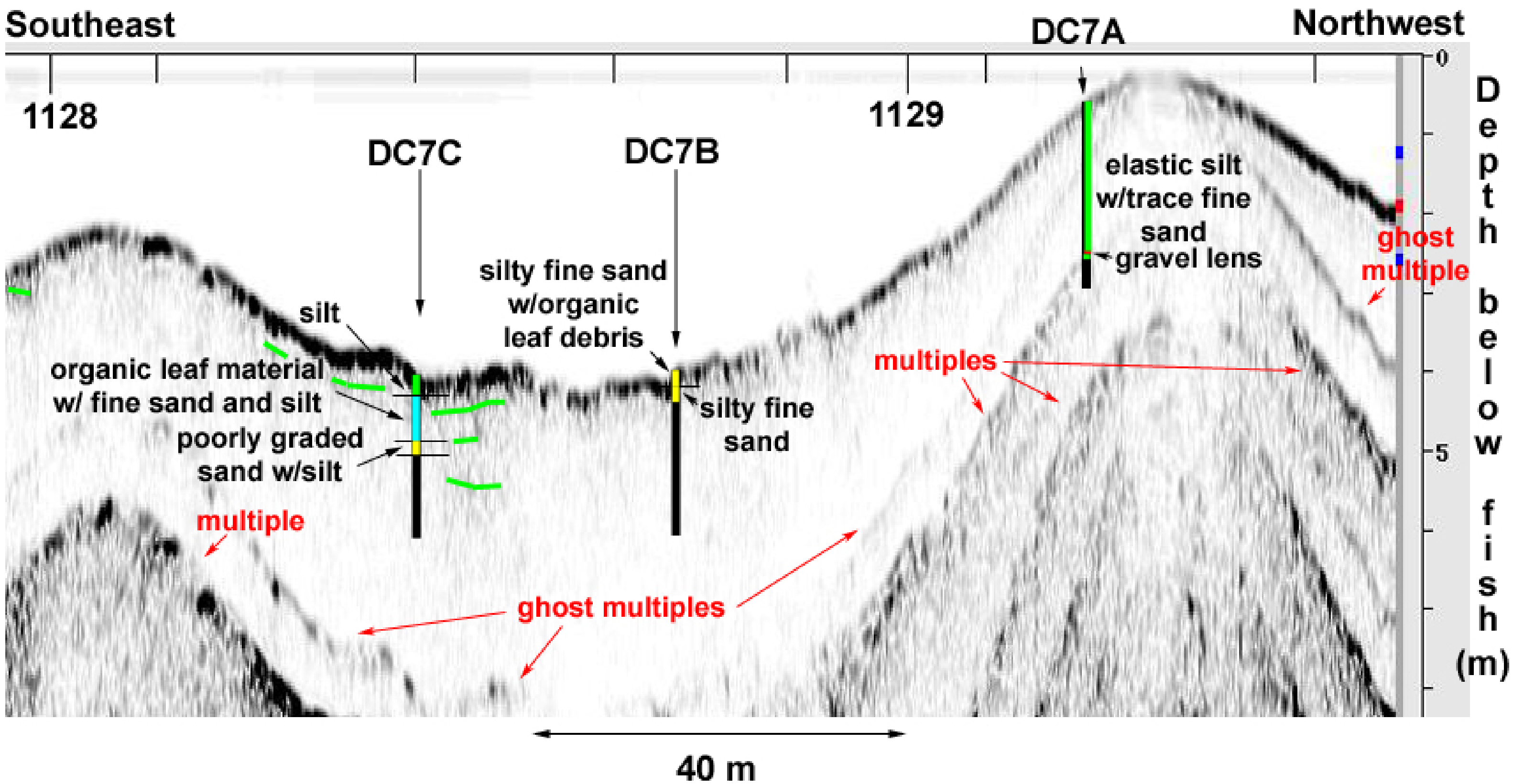


Figure 150. Chirp sub-bottom profile (Profile 7B) along Transect 7. Shown are deep cores DC7A, DC7B, and DC7C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 133. 1128 and 1129 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

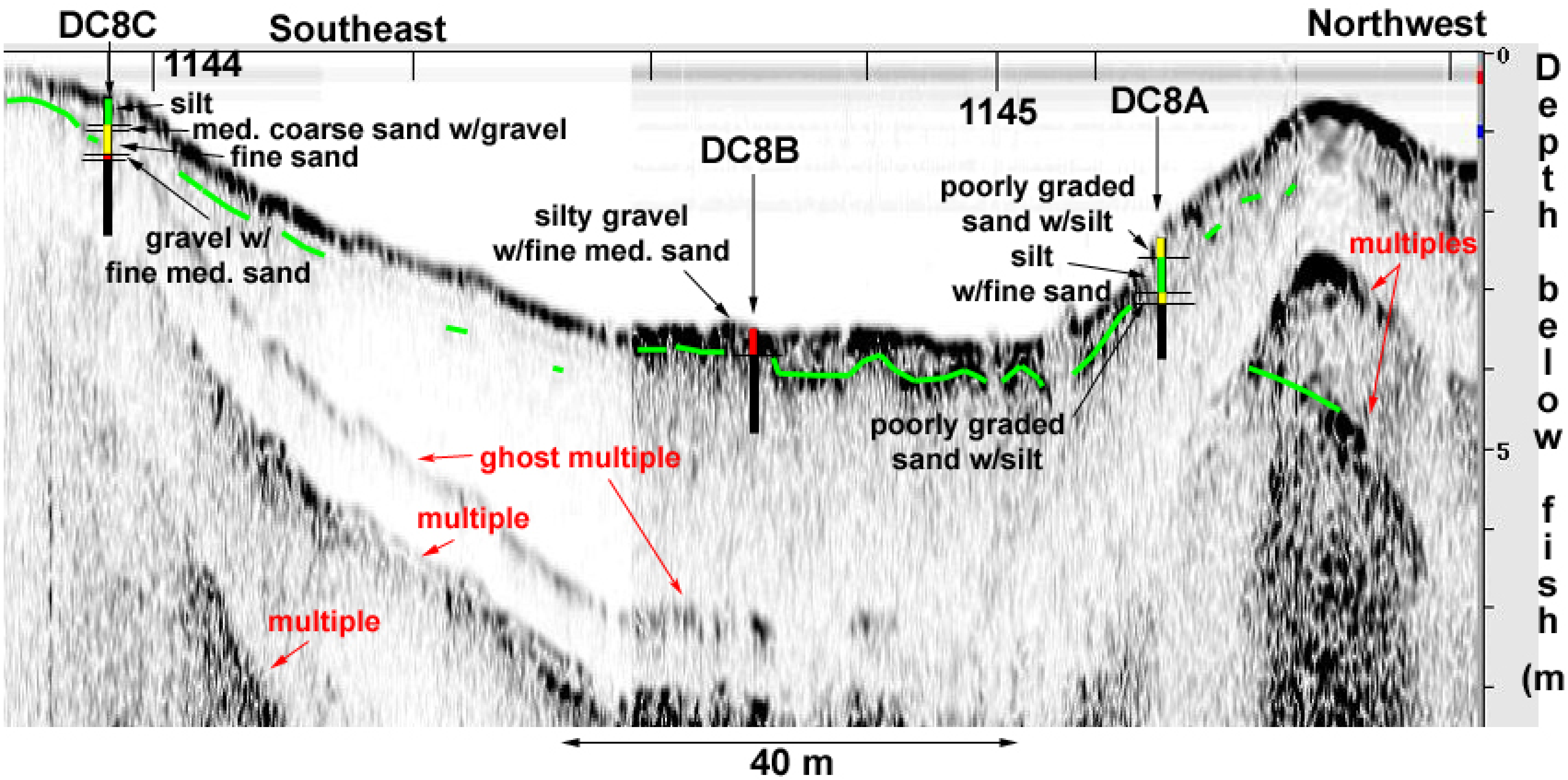


Figure 151. Chirp sub-bottom profile (Profile 8B) along Transect 8. Shown are deep cores DC8A, DC8B, and DC8C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 134. 1144 and 1145 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

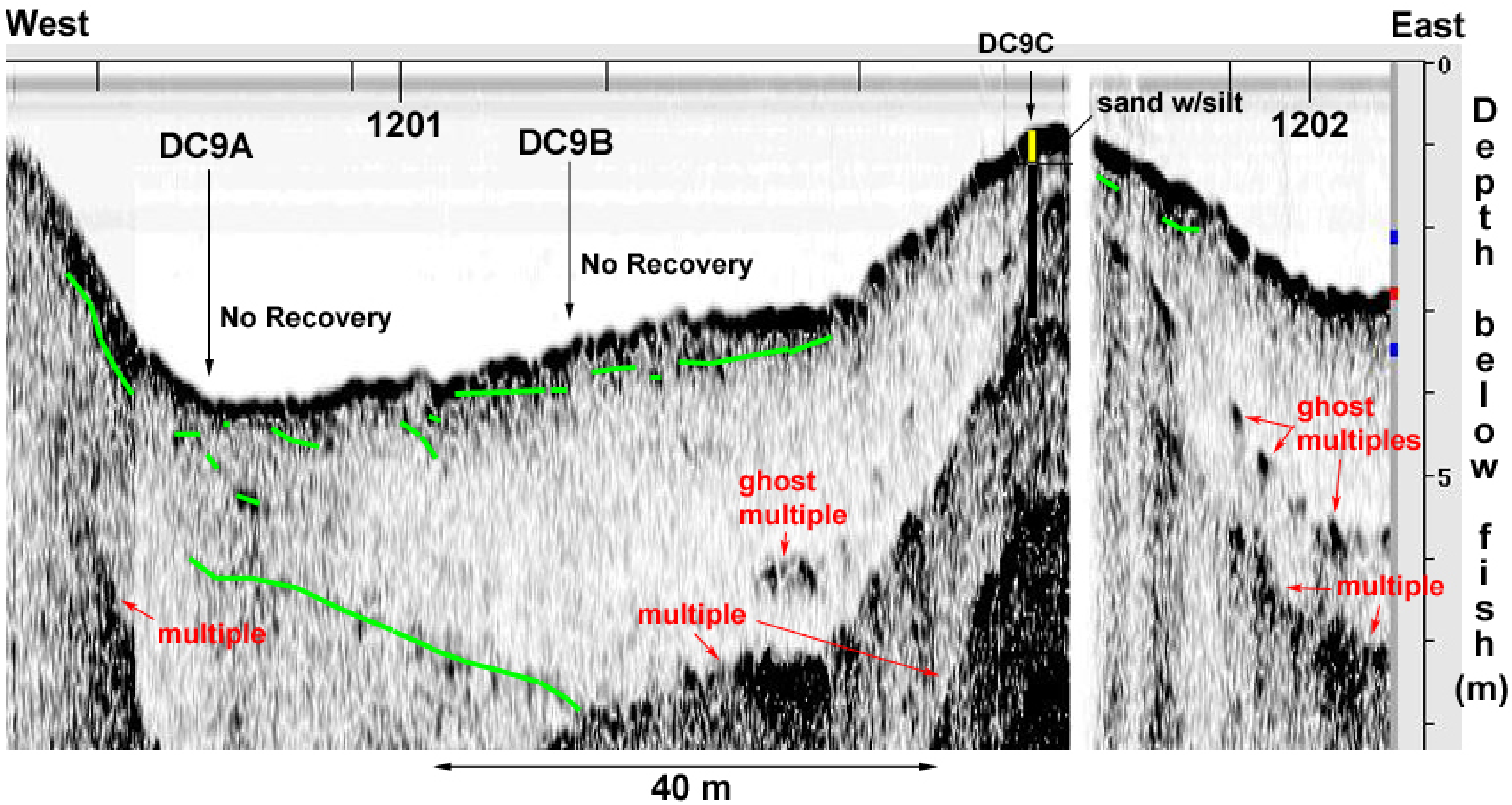


Figure 152. Chirp sub-bottom profile (Profile 9B) along Transect 9. Shown are deep cores DC9A, DC9B, and DC9C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 135. 1201 and 1202 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

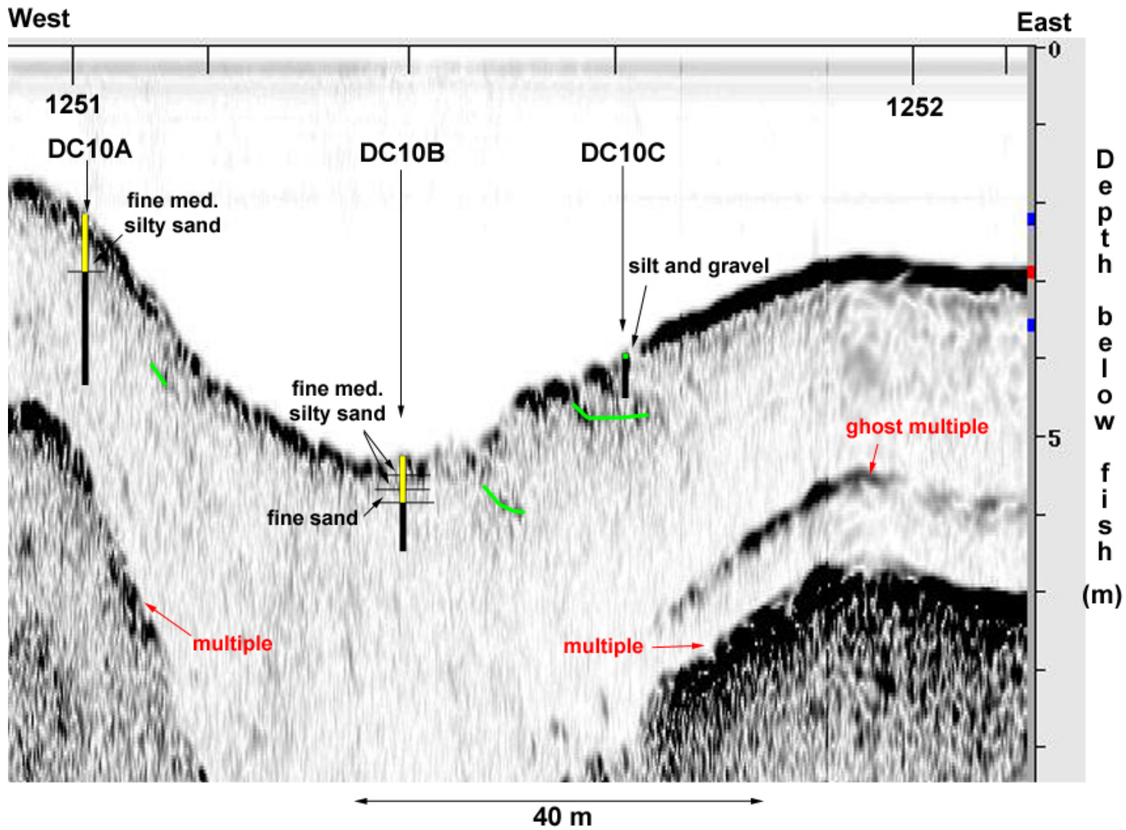


Figure 153. Chirp sub-bottom profile (Profile 10B) along Transect 10. Shown are deep cores DC10A, DC10B, and DC10C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 139. 1251 and 1252 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

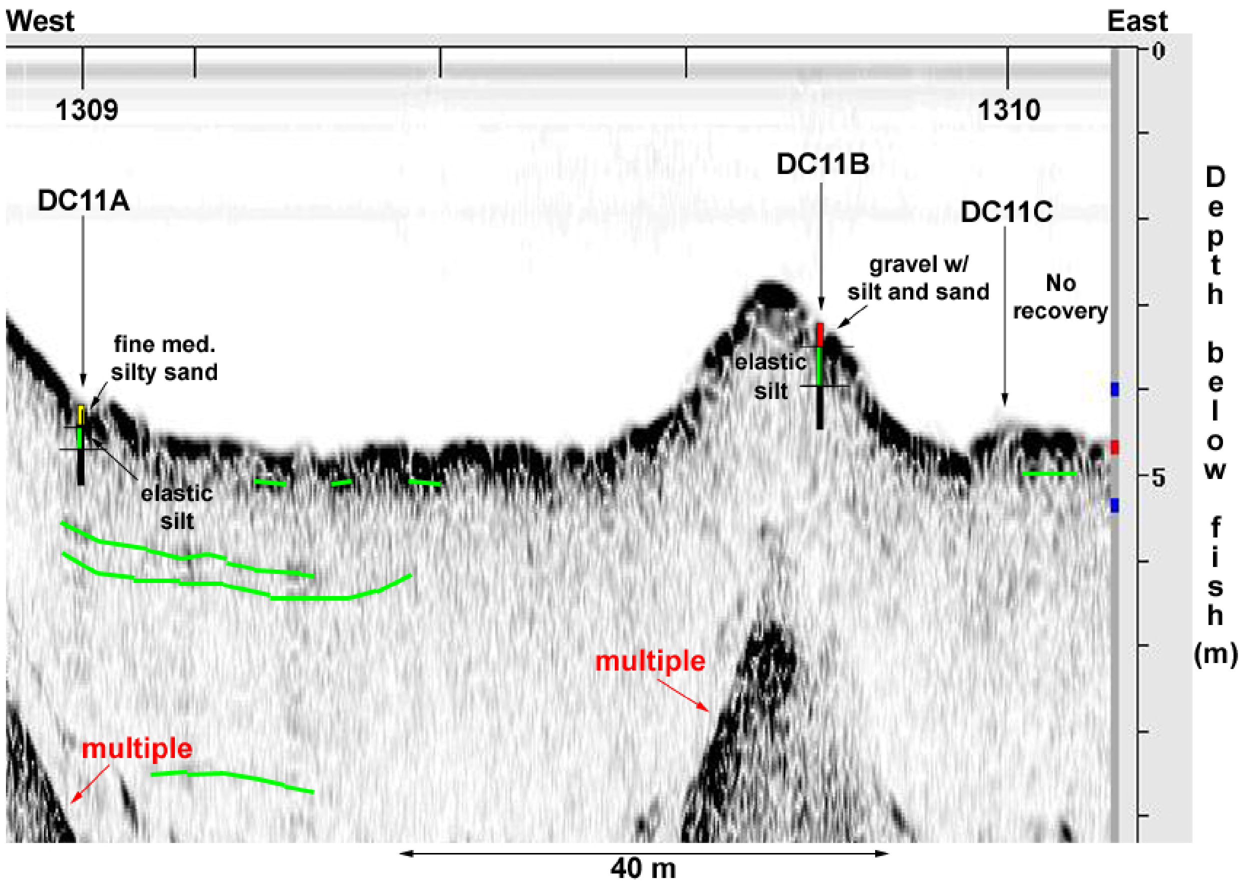


Figure 154. Chirp sub-bottom profile (Profile 11B) along Transect 11. Shown are deep cores DC11A, DC11B, and DC11C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 137. 1309 and 1310 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

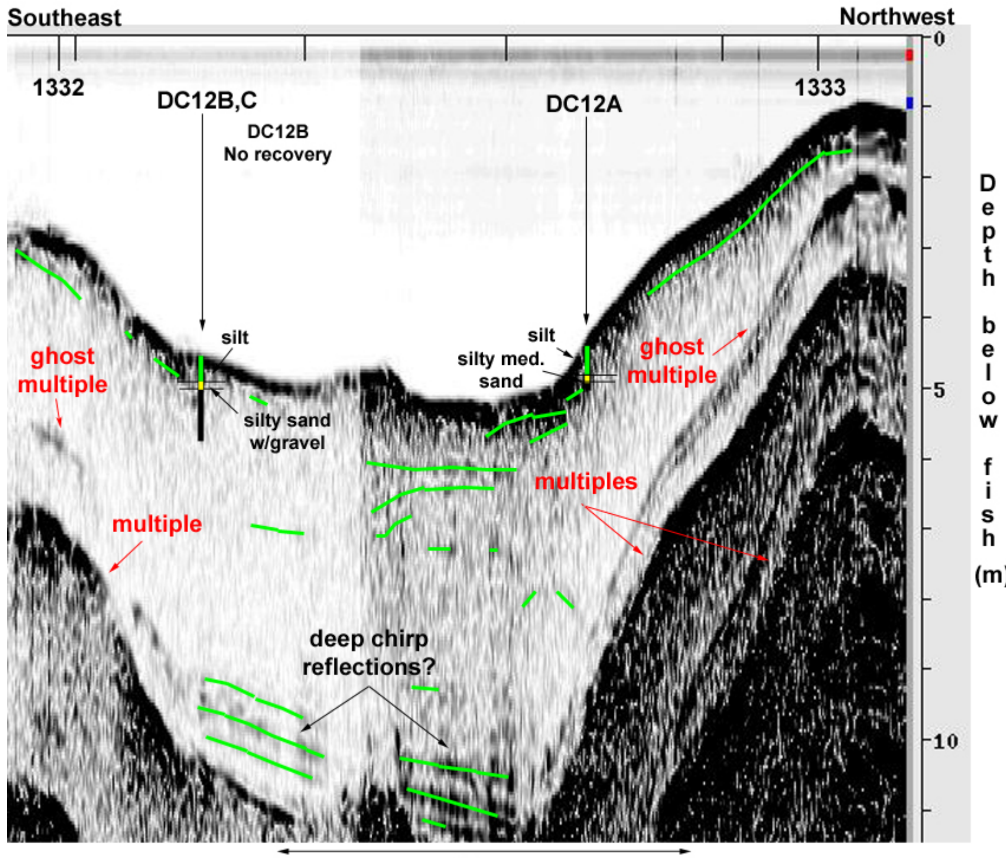


Figure 155. Chirp sub-bottom profile (Profile 12C) along Transect 12. Shown are deep cores DC12A, DC12B, and DC12C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 138. 1332 and 1333 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

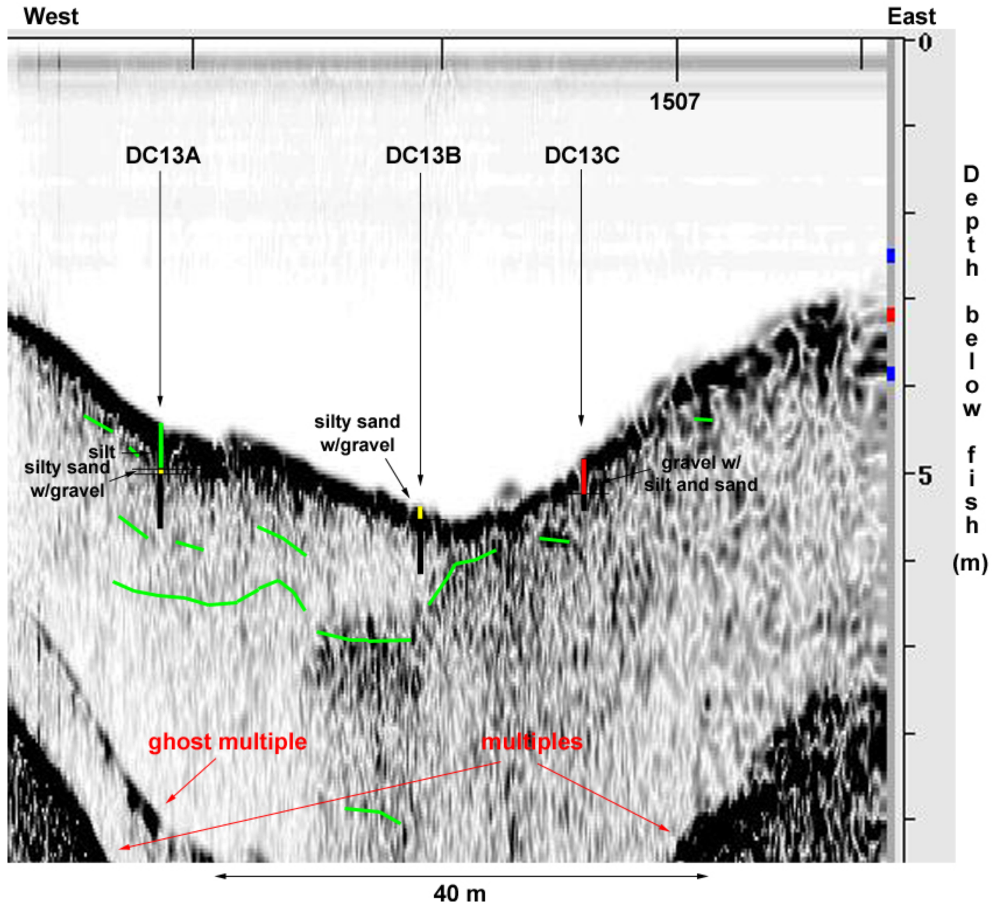


Figure 156. Chirp sub-bottom profile (Profile 13A) along Transect 13. Shown are deep cores DC13A, DC13B, and DC13C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 139. 1507 is time label for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

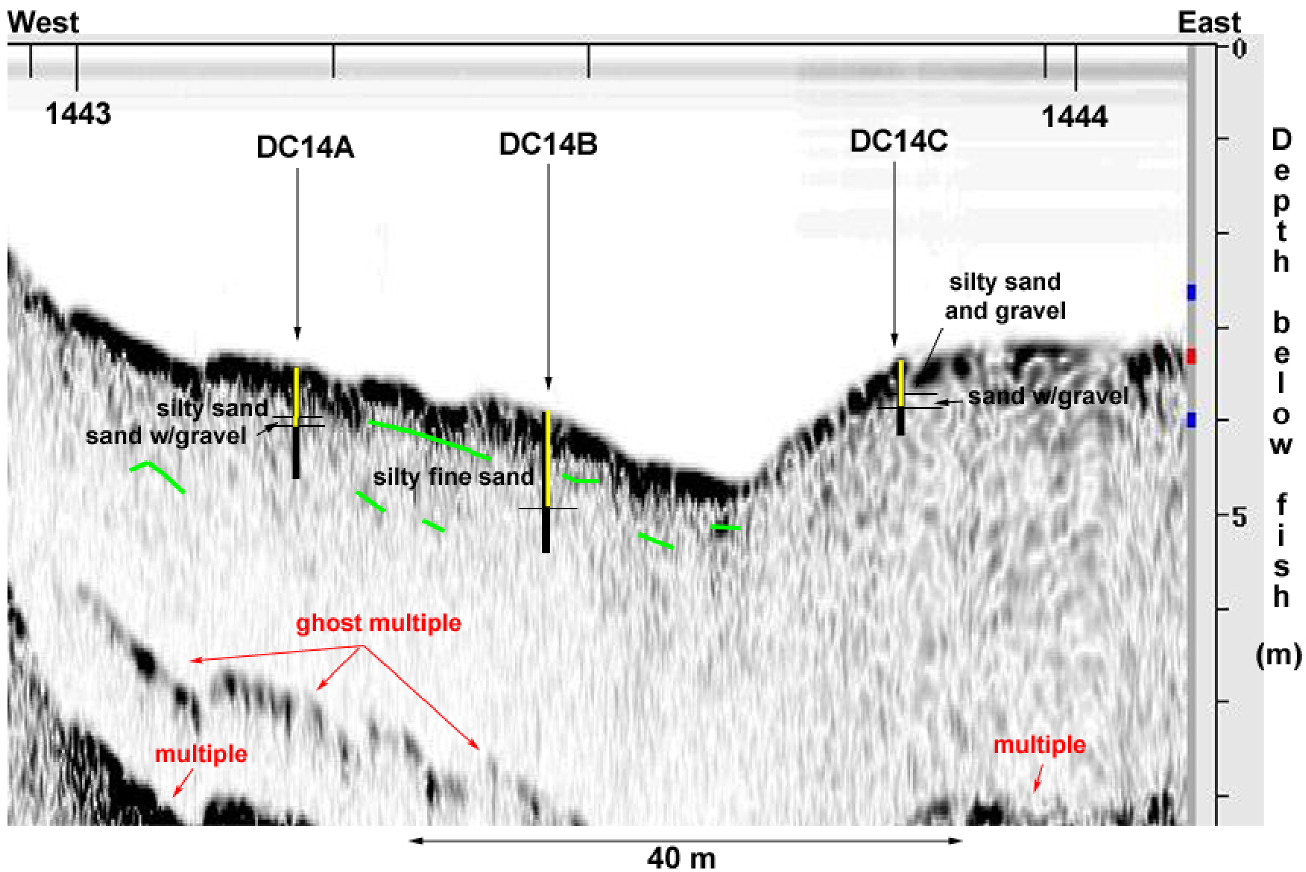


Figure 157. Chirp sub-bottom profile (Profile 14A) along Transect 14. Shown are deep cores DC14A, DC14B, and DC14C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 140. 1443 and 1444 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

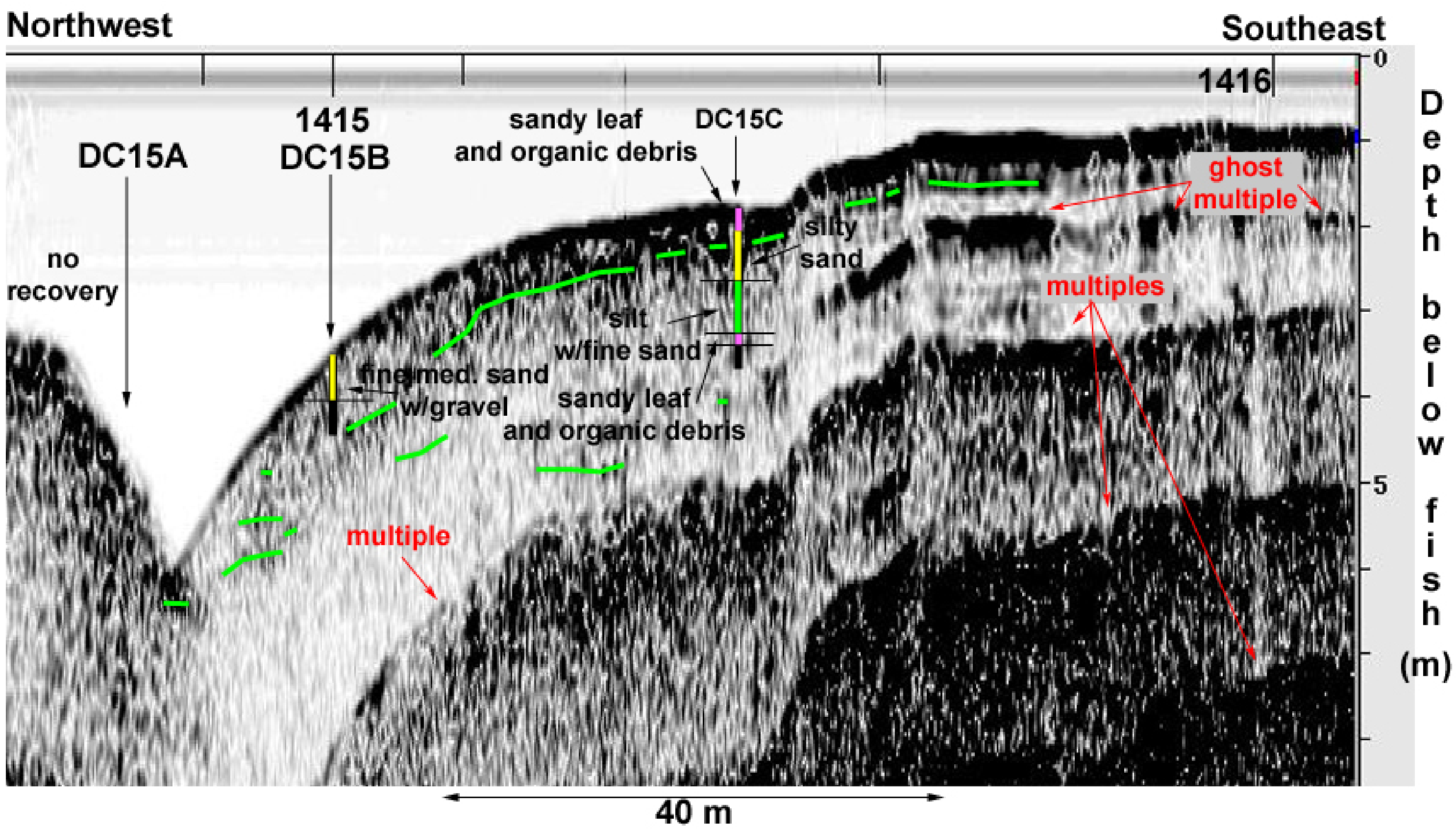


Figure 158. Chirp sub-bottom profile (Profile 15C) along Transect 15. Shown are deep cores DC15A, DC15B, and DC15C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 141. 1415 and 1416 are time labels for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

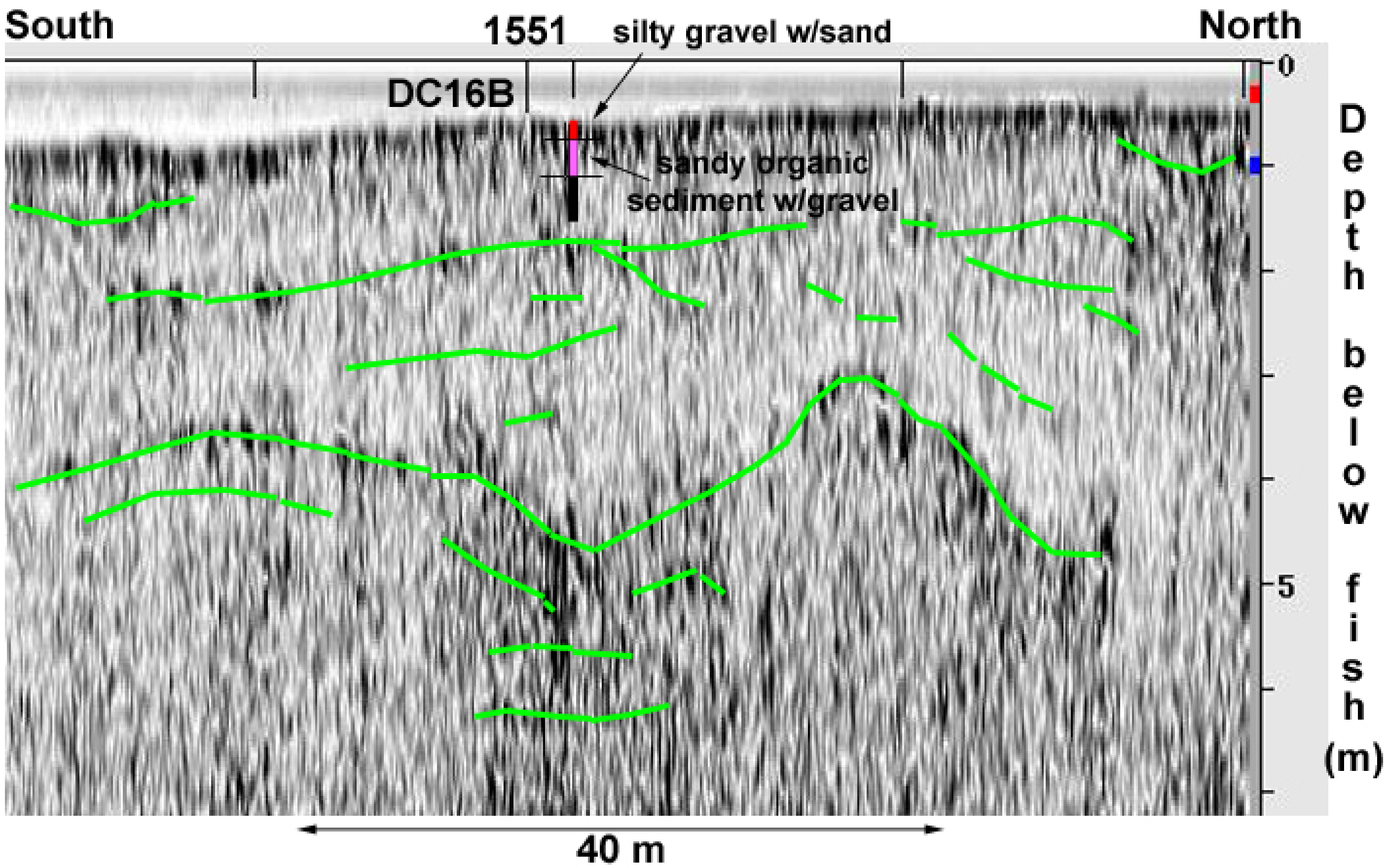


Figure 159. Chirp sub-bottom profile along deep core DC16B. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 142. 1551 is a time label for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

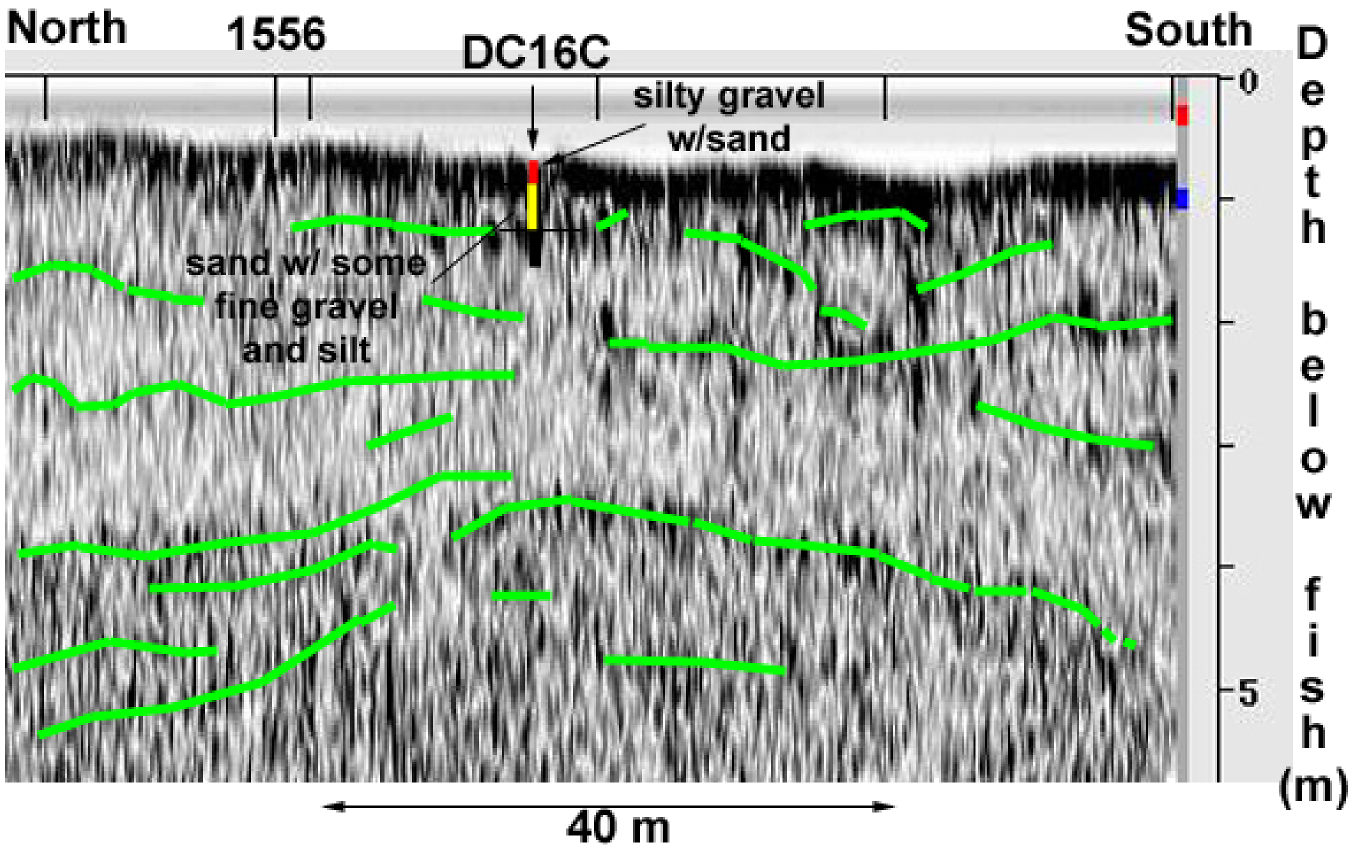


Figure 160. Chirp sub-bottom profile along deep core DC16C. Thick vertical lines indicate sediment types encountered in the cores. Colors correspond to: purple – peat, blue – clays, green – silts, yellow – sands, red – gravels, black – no recovery of sediments. Thinner green horizontal lines indicate major chirp sub-bottom reflections. Location of profile is shown in Figures 125 and 142. 1556 is a time label for the chirp trackline. Depth along chirp profile is given as meters below the chirp towfish.

IV. Project Conclusions

The gradiometer survey revealed 147 distinct magnetic anomalies, 9 of which are associated with non-car side scan sonar targets. The magnetic anomalies associated with the cars in the side scan sonar records were not included. Of those remaining 138 magnetic anomalies, 46 have magnetic signatures indicative of larger shallow objects. The remaining 92 magnetic anomalies have signatures indicative of large-deep objects or smaller shallow targets. The size of an object that can be considered a possible obstruction to future dredging operations from a mechanical standpoint depends on the dredging methodology used. Prior to future dredging operations, if any, the dredger should be consulted regarding mass of what is to be considered an obstruction to their operations. The magnetic targets to be impacted should be evaluated against this factor and the proposed dredge depth, and investigated further should they be determined to be an obstruction. Other than the magnetic anomaly associated with the potentially significant side scan sonar target, none of the targets located during the magnetometer survey were found to have images or signatures indicative of historically significant submerged cultural resources.

The side scan sonar survey identified 40 sonar targets were found that could pose a threat to future dredging operations, if dredging is deemed necessary. Of those, 16 targets with acoustic signatures similar in dimension and appearance to cars were detected. The majority of the car targets are clustered in the river in the vicinity of Newark, NJ. One car target was found considerably further upriver between the Conrail and Rutherford Ave. (Rt. 3) bridges. Though side scan sonar cannot guarantee that all of these 16 targets are automobiles, further investigation is recommended to determine the nature of the objects detected. Twenty-four other sonar targets were found that could be obstructions or pose a threat to future operations on the river. One sonar target, the remains of a vessel, should be investigated further should future project operations impact the site as it has the potential to be classified as a historically significant submerged cultural resource.

The simplified surficial seabed classification map was produced from a combined analysis of the side scan sonar mosaics, short core sampling program results, and Quester Tangent classification software. This map showed significant change occurs near the West Arlington railroad bridge. The riverbed downriver from this point can be described as primarily silt. Areas around bridges were found to have been scoured out and were less likely to have silt deposits. As the shorelines along the river have been ‘improved’ to help control erosion, many areas were found to have rock and gravel forming the edges of the river. Above this bridge, the riverbed is much more varied. Primarily, the center of the channel is either sand or a silt/sand combination. Areas of silt are present, though primarily limited to the depositional areas on the inside of the bends in the river. From just below the 8th Street Bridge in Wallington to the uppermost reach of the area surveyed, the riverbed consists primarily of sand and gravel, with large rock and boulders in certain areas. This section of the river is generally shallow with swift water flow.

The maximum depth of penetration of the chirp sonar was on the order of 25 feet with the greatest penetration depths occurring along the Kearny Point Reach. Additional areas along the river where depths of penetration deeper than 10 feet were observed included the area near the Arlington and Belleville Reaches. Based on an analysis of the chirp data, approximately 20 percent of the region surveyed along the Lower Passaic River had no significant penetration of chirp sound energy into the sub-bottom. Between 70 and 75 percent of the region surveyed with the chirp sonar was characterized by penetration into the sub-bottom to depths between 1 foot and 9 feet. Most of this region had penetration depths less than 6 feet. As documented in the shallow and deep cores, the predominant sediment type was silt and the major variations in the sediments were the amount of silt relative to clays, sands, and gravels. This variation in the silts could be correlated with most of the chirp sub-bottom reflections that were observed. Of the shallow (<1 foot to 2 feet) chirp reflection events, the occurrence of "soft" silts overlying either firmer/tighter silts or silts with fine sands was one of the most pronounced events observed.

In an examination of the chirp profiles associated with the transects where the deep cores were obtained, there is a great deal of variability in the nature of the chirp reflection profiles. This variability, especially in depth of penetration and the continuity of reflection events, is in part due to the heterogeneity in the types of sediments that were observed in the cores. Although dominantly silts, the presence of organic-rich sediments (and leaf debris on the bottom) and varying amounts of gravels to graded sands, silts, and clays makes it difficult to correlate sediments from transect to transect along the various reaches of the river. This in turn affects the quality of the chirp profiles and the ability to trace individual reflection events between the transect areas, and even within a given transect area.

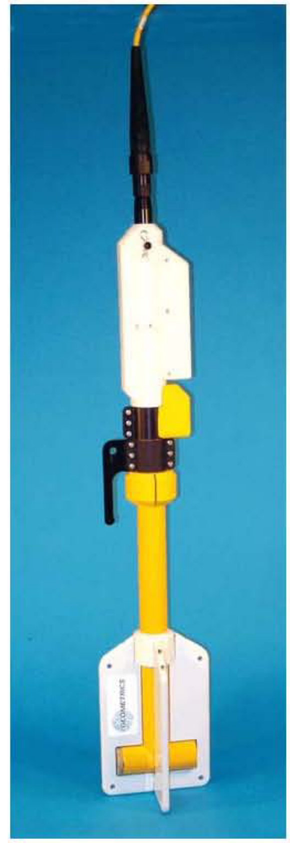
Appendix A

Equipment Specifications

GEOMETRICS

G-882 MARINE MAGNETOMETER

- ***CESIUM VAPOR HIGH PERFORMANCE – Highest detection range and probability of detecting all sized ferrous targets***
- ***NEW STREAMLINED DESIGN FOR TOW SAFETY – Low probability of fouling in lines or rocks***
- ***NEW QUICK CONVERSION FROM NOSE TOW TO CG TOW – Simply remove a stainless steel locking pin, move tow point and reinsert. New easy carry handle built in!***
- ***NEW INTERNAL CM-221 COUNTER MODULE – Provides Flash Ram for storage of default parameters set by user***
- ***NEW ECHOSOUNDER / ALTIMETER OPTION***
- ***NEW DEPTH RATING – 4,000 psi !***
- ***HIGHEST SENSITIVITY IN THE INDUSTRY – 0.004 nT/Hz RMS with the internal CM-221 Mini-Counter***
- ***EASY PORTABILITY & HANDLING – no winch required- single man operation, 44 lbs with 200 ft cable (without weights or depressor wing)***
- ***COMBINE TWO SYSTEMS FOR INCREASED COVERAGE – Internal CM-221 Mini-Counter provides multi-sensor data concatenation allowing side by side coverage which maximizes detection of small targets and reduces noise***



G-882 with Weight Collar Depth Option

Very high resolution Cesium Vapor performance is now available has been incorporated into a low cost, small size system for professional surveys in shallow or deep water. High sensitivity and sample rates of total field measurements are maintained for all applications. The well proven Cesium sensor is combined with a unique new CM-221 Larmor counter and ruggedly packaged for small or large boat operation. Use your computer and standard printer with our MagLog Lite™ software to log, display and print GPS position and magnetic field data. Model G–882 is the lowest priced - highest performance fully operational marine mag system ever offered.

The G-882 is flexible for operation in small boat, shallow water surveys as well as deep tow applications (4,000 psi rating, telemetry over steel coax available to 10Km). Being small and lightweight (44 lbs net, no weights) it is easily deployed and operated by one man. But add several no-foul weight collars and the system can quickly weigh in at more than 100 lbs. Power may be supplied from a 24 to 30 VDC battery supply or the included 110/220 VAC power supply. The tow cable uses high strength Kevlar and it's length is standard at 200 ft (61 m) with optional cable up to 500m (no telemetry). The shipboard end of the tow cable is attached to a junction box or on-board cable for quick and simple hookup to power and output of data into any IBM PC computer. A rugged fiber-wound fiberglass housing provides selectable orientation of the sensor and therefore maintains operations throughout the world with only small limitations as to direction of survey in equatorial regions.

The G-882 Cesium magnetometer provides the same operating sensitivity and sample rates as the larger deep tow model G-880. MagLogLite™ Logging Software is offered with each magnetometer and allows recording and display of data and position with Automatic Anomaly Detection! Additional options include: MagMap2000 plotting and contouring software and post acquisition processing software MagPick™ (free from our website.)

The G-882 system is particularly well suited for the detection and mapping of all sizes of ferrous objects. This includes anchors, chains, cables, pipelines, ballast stone and other scattered shipwreck debris, munitions of all sizes, aircraft, engines and any other object with magnetic expression. Objects as small as a 5 inch screwdriver are readily detected provided that the sensor is close to the seafloor and within practical detection range.(Refer to table at right).

The design of this special marine unit is directed toward the largest number of user needs. It is not intended to meet all marine requirements such as deep tow through long cables or monitoring fish altitude. Rugged design with highest performance at lowest cost are the goals.

Typical Detection Range For Common Objects

Ship 1000 tons	0.5 to 1 nT at 800 ft (244 m)
Anchor 20 tons	0.8 to 1.25 nT at 400 ft (120 m)
Automobile	1 to 2 nT at 100 ft (30 m)
Light Aircraft	0.5 to 2 nT at 40 ft (12 m)
Pipeline (12 inch)	1 to 2 nT at 200 ft (60 m)
Pipeline (6 inch)	1 to 2 nT at 100 ft (30 m)
100 KG of iron	1 to 2 nT at 50 ft (15 m)
100 lbs of iron	0.5 to 1 nT at 30 ft (9 m)
10 lbs of iron	0.5 to 1 nT at 20 ft (6 m)
1 lb of iron	0.5 to 1 nT at 10 ft (3 m)
Screwdriver 5 inch	0.5 to 2 nT at 12 ft (4 m)
1000 lb bomb	1 to 5 nT at 100 ft (30 m)
500 lb bomb	0.5 to 5 nT at 50 ft (16 m)
Grenade	0.5 to 2 nT at 10 ft (3 m)
20 mm shell	0.5 to 2 nT at 5 ft (1.8 m)

MODEL G-882 CESIUM MARINE MAGNETOMETER SYSTEM SPECIFICATIONS

OPERATING PRINCIPLE:	Self-oscillating split-beam Cesium Vapor (non-radioactive)
OPERATING RANGE:	20,000 to 100,000 nT
OPERATING ZONES:	The earth's field vector should be at an angle greater than 6° from the sensor's equator and greater than 6° away from the sensor's long axis. Automatic hemisphere switching.
CM-221 COUNTER SENSITIVITY:	<0.004 nT/√Hz rms. Typically 0.02 nT P-P at a 0.1 second sample rate or 0.002 nT at 1 second sample rate. Up to 10 samples per second
HEADING ERROR:	±1 nT (over entire 360° spin and tumble)
ABSOLUTE ACCURACY:	<3 nT throughout range
OUTPUT:	RS-232 at 9600 Baud
MECHANICAL:	
Sensor Fish:	Body 2.75 in. (7 cm) dia., 4.5 ft (1.37 m) long with fin assembly (11 in. cross width), 40 lbs. (18 kg) Includes Sensor and Electronics and 1 main weight. Additional collar weights are 14lbs (6.4kg) each, total of 5 capable
Tow Cable:	Kevlar Reinforced multiconductor tow cable. Breaking strength 3,600 lbs, 0.48 in OD, 200 ft maximum. Weighs 17 lbs (7.7 kg) with terminations.
OPERATING TEMPERATURE:	-30°F to +122°F (-35°C to +50°C)
STORAGE TEMPERATURE:	-48°F to +158°F (-45°C to +70°C)
ALTITUDE:	Up to 30,000 ft (9,000 m)
WATER TIGHT:	O-Ring sealed for up to 9000 ft (2750 m) depth operation
POWER:	24 to 32 VDC, 0.75 amp at turn-on and 0.5 amp thereafter
ACCESSORIES:	
Standard:	CM-201 View Utility Software operation manual and ship case
Optional:	Telemetry to 10Km coax, gradiometer (longitudinal or transverse)
MagLog Lite™ Software:	Logs, displays and prints Mag and GPS data at 10 Hz sample rate. Automatic anomaly detection and single sheet Windows printer support

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE *4/03*

GEOMETRICS, INC. 2190 Fortune Drive, San Jose, California 95131
408-954-0522 ● Fax 408-954-0902 ● Internet: sales@mail.geometrics.com

GEOMETRICS Europe Manor Farm Cottage, Galley Lane, Great Brickhill, Bucks, England MK179AB ● 44-1525-261874 ● Fax 44-1525-261867

GEOMETRICS China Laurel Industrial Co. Inc. - Beijing Office, Room 2509-2511, Full Link Plaza Chaoyangmenwai Dajie, Chaoyang District, Beijing, China 100020
10-6588-1126 (1127..1130), 10-6588-1132 ● Fax 010-6588-1162

#18

GEOMETRICS

FULL SPECTRUM
SUB-BOTTOM PROFILER

X-STAR

Sub-Bottom Profiler Shallow Tow System

X-STAR is a high resolution wideband Frequency Modulated (FM) sub-bottom profiler utilizing EdgeTech's proprietary FULL SPECTRUM™ CHIRP technology. The system transmits a FM pulse that is linearly swept over a full spectrum frequency range (for example 2-16 kHz for 20 milliseconds.) The acoustic return received at the hydrophones is passed through a pulse compression filter, generating high resolution images of the sub-bottom stratigraphy in oceans, lakes, and rivers.

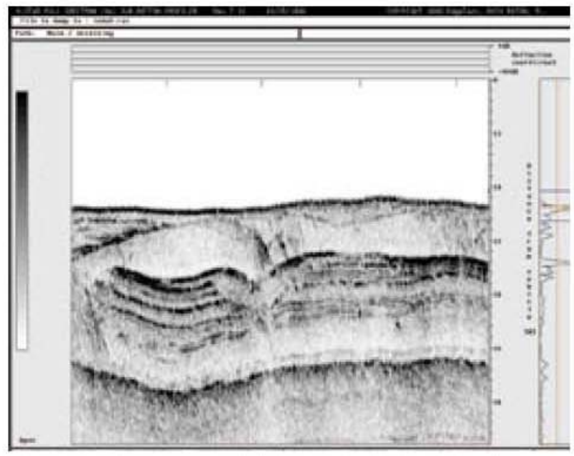
Because the FM pulse is generated by a digital to analog converter with a wide dynamic range and a transmitter with linear components, the energy, amplitude, and phase characteristics of the acoustic pulse are precisely controlled. This precision results in high repeatability and signal definition required for sediment classification.

Several stable, low drag tow vehicles are available that contain wide band transmitter arrays and sensitive line array receivers that can operate in water depths up to 300 meters. The selection of tow vehicle depends on the sub-bottom characteristics and resolution required.

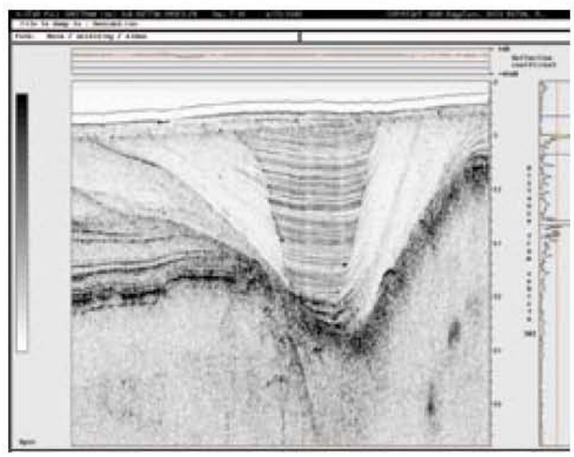
Full Spectrum Benefits

FM pulses have been used in radar for over 30 years and are sometimes called chirp or swept frequency pulses. Its application in sonar systems has come with the availability of high speed Digital Signal Processors (DSP).

Full Spectrum signal processing technology uses a proprietary matched filter to process wideband signals. This matched filter uses special amplitude and phase weighting functions for the transmitted pulse and a pulse compression filter that maximizes the Signal to Noise Ration (SNR) of the acoustic images over a wide band of operating frequencies. These X-STAR signal processing features provide a significant SNR improvement in the acoustic image generated by other impulse and chirp sonars with band limiting components that are limited in dynamic range.



Unequalled images that combine good penetration and high resolution. 20-30 dB improved SNR over conventional systems by using Full Spectrum (FM) Pulses.



• EEZ resource development • Geo-technical surveys • Hazard surveys • Environmental site investigations • Geological studies • Sediment classification • Buried object location • Search and recovery • Locate and map buried pipelines and cables • Mining and dredging surveys • Bridge and shoreline scour surveys

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THE SOUND SOLUTION

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E-mail: sales@edgetech.com • Website: www.edgetech.com

One of the outstanding aspects of Full Spectrum signal processing is the use of a broad bandwidth transmitting pulse that sweeps out over a range of frequencies. This generates a great deal of acoustic energy in the water. Instead of trying to operate with one very sharp acoustic peak pulse, like conventional CW systems, the Full Spectrum sonar spreads the transmission out over a long time duration. In addition, to the resolution improvement, the process of correlation processing achieves a signal processing gain over the background noise. To equal the typical performance of the Full Spectrum sonar pulse, conventional pulsed sonar would have to operate at a peak pulse power 100 times higher than the Full Spectrum pulse.

Normally, when using long pulses the resolution of the seabed is lost. Resolution of the seabed is regained after correlation processing the received signal. This is because the output of the correlation is a very sharp wavelet that has duration of the order of the inverse of the sweep bandwidth. Thus, the more bandwidth used, the sharper this pulse will become.

Another important feature, which enhances the ability of the Full Spectrum Sub-bottom Profiler system to classify sediments, is realized by the built-in de-convolution of the system response from the output pulse. The sonar's system impulse response is measured at the factory and is used to design a unique output pulse that will prevent the source from ringing. In addition to this, the Full Spectrum wavelet is weighted in the frequency domain to have a Gaussian like shape. As the Gaussian shaped spectrum is attenuated by the sediment, energy is lost but its bandwidth is preserved. Thus, even after being attenuated by 20 meters of sand, the Full Spectrum pulse has approximately the same resolution as a non-attenuated pulse.

The Full Spectrum Sonar side lobes are greatly reduced in the effective transducer aperture. The wide bandwidth of the sweep frequency smears the side lobes of the transducer and thus achieving a beam pattern with virtually no side lobes. The effective spatial beam width obtained after processing the Full Spectrum sub-bottom pulse is typically 20 degrees measured to the -3db points. This feature is clear when inspecting the Full Spectrum records. Since the transmitted pulse is highly repeatable and its peak amplitude is precisely known, the sediment reflective values can be estimated from the peak pulse amplitude measurements of the bottom returns.

Use different tow vehicles for desired penetration and resolution. The topside portion remains the same. The FM pulse is user selected based on the sub-bottom conditions at the survey site and the type of sub-bottom features that need to be imaged.

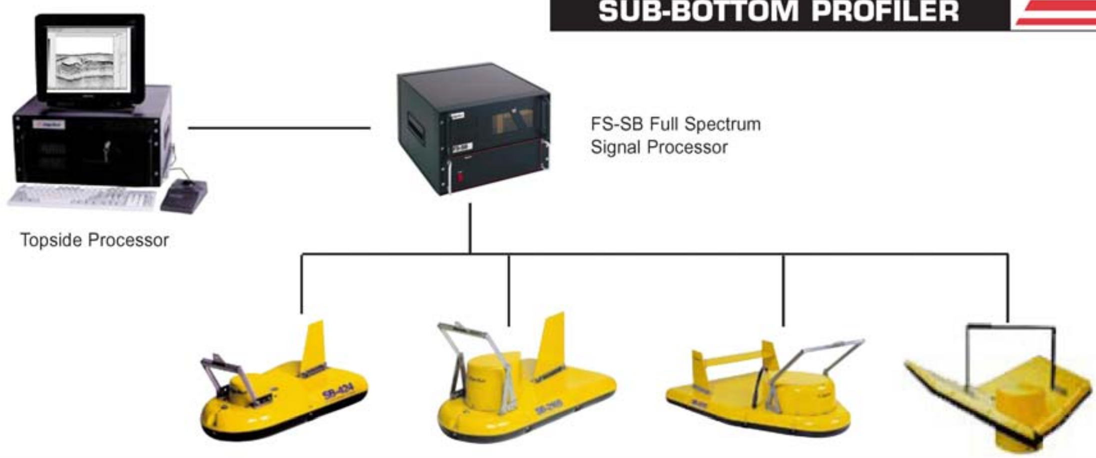
Configuration

The X-STAR sub-bottom profiler has a separate transmitter(s) constructed from wideband piston type transducers and separate acoustic receivers that are a discrete line array of PZT crystals. Separate receiving and transmitting arrays are used to preserve linearity and to allow simultaneous transmission and reception. The acoustic sensors are mounted in tow vehicles designed for profiling at ship speeds varying from 0 (drifting) to 7 knots.

X-STAR is designed for modular deployment. The heart of the system is a Signal Amplifier and Processor (Model FS-SB). It is here where the Full Spectrum signal is generated for output and filtered on reception. One of four tow vehicles may be connected. While EdgeTech supplies its own Topside Display Processor (Model TD-SB), it is also possible to interface other 3rd Party Topsides. EdgeTech has entered into agreements with several Topside Manufactures who support the EdgeTech Full Spectrum products.

Contact EdgeTech for X-STAR systems that are available in several other deployment options; Hull Mount, Deep Towed, ROV Mounted, and AUV/UUV Mounted.

FULL SPECTRUM
SUB-BOTTOM PROFILER



Towfish Model	SB-424	SB-216S	SB-0512	SB-0408
Frequency Range	4-24 kHz	2 - 16 kHz	500 Hz - 12 kHz	400 Hz - 8 kHz
Pulse Type	FM	FM	FM	FM
Standard Pulse Bandwidths / Length (other custom pulses available)	3-24 kHz / 10 ms 4-24 kHz / 10 ms 4-20 kHz / 10 ms 4-16 kHz / 10 ms	2-15 kHz / 20 ms 2-12 kHz / 20 ms 2-10 kHz / 20 ms	2-12 kHz / 20 ms 2-10 kHz / 20 ms 2-8 kHz / 40 ms 1.5-7.5 kHz / 40 ms 1-6 kHz / 40 ms 1-5 kHz / 40 ms 0.5-5 kHz / 40 ms	1.5-10 kHz / 20 ms 1-7 kHz / 40ms 1-6 kHz / 40 ms 0.7-4.5 kHz / 40 ms 0.6-3.0 kHz / 40 ms 0.4-2.4 kHz / 40 ms
Vertical Resolution	4 cm / 4-24 kHz 6 cm / 4-20 kHz 8 cm / 4-16 kHz	6 cm / 2-15 kHz 8 cm / 2-12 kHz 10 cm / 2-10 kHz	8 cm / 2-12 kHz 12 cm / 1.5–7.5 kHz 19 cm / 1- 5 kHz	9 cm / 1.5 kHz-10 kHz 15 cm / 1-6 kHz 37 cm / 0.4-2.4 kHz
Penetration (typical)				
in coarse calcareous sand	2	6	20	40
in clay	40	80	200	300
Beam Width (depends on center frequency)	16° / 4-24 kHz 19° / 4-20 kHz 23° / 4-16 kHz	17° / 2-15 kHz 20° / 2-12 kHz 24° / 2-10 kHz	16° / 2-12 kHz 24° / 1.5–7.5 kHz 32° / 1- 6 kHz	10° / 1.5 kHz-10 kHz 14° / 1-7 kHz 37° / 0.4-2.4 kHz
Transmitters	1	1	4	2
Receive Arrays	2	2	4	8
Size (centimeters)	77L x 50W x 34H	105L x 67W x 46H	210L x 134W x 46H	249 L x 214W x 91
Weight (kilograms)	22	44	186	364
Shipping weight (kg.)	82	122	288	consult factory
dimension (cm.)	L89 x W64 x H54	L115 x W79 x H59	L172 x W137 x H58	
Cable Requirements	3 shielded twisted pairs (5 used)	same	same	3 shielded twisted pairs (all used)
Max Depth (meters)	300	300	300	300
GeoStar Interface	Yes	Yes	No	No

Other System Specifications

Tow Speed	3-5 knots optimal, 7 knots maximum safe operational
MaximumTow Fish Operating Depth	300 meters (1,000 feet)
Optimum tow height	3 to 5 meters above seafloor
Calibration	Each system is acoustic tank tested to calibrate for reflection coefficient measurements

R2-0007456

FULL SPECTRUM
SUB-BOTTOM PROFILER

FS-SB Full Spectrum Processor

Main Processor	Intel CPU with high speed PCI bus
Digital Signal Processor	TMS320
Memory	32 MB RAM
Storage	Hard drive, CD-ROM, floppy disk
Operating System	Windows® 98
I/O to Topside Processor	Ethernet
A/D	Analog Input, 16 bit resolution, 200 kHz max. sampling rate
D/A	Analog Output,16 bit resolution, 200 kHz max. sampling rate
Pulse Type	Full Spectrum (Frequency Modulated with amplitude and phase weighting)
Pulse Trigger	Internal or External
Pulse Repetition	0.5 to 12 Hz
Trigger In	TTL negative edge triggered (Middle BNC)
Trigger Out	TTL negative edge triggered. Minimum 5ms long pulse (Lower BNC)
Sampling Rate	Typically 20, 25, 40, or 50 kHz depending on the pulse upper frequency
Acoustic Power	212 dB ref 1μPa peak at center frequency of system
Input Power	120 or 220 VAC Auto Sensing
Power Amplifier	Type: Two channel, Gain: 33dB per channel, Power output: 2000 Watts peak, Power input: 110-120V/60Hz or 220-240 V/50Hz Manually Switchable
Topside Display Processors w/ Support	EdgeTech, CODA Technologies Ltd., Sea Corp., TEI Inc.
Environment	Temperature: 0 to 40°C, Humidity: 5% to 95% relative, Vibration: Normal ship environment
Enclosure	Portable steel case suitable for transit. Unit can be removed from case and mounted in a 19" rack. Size: 50W x 60D x 33H cm. (19.5x23.5x13 in), Weight: 46 kg (102 lbs.)
Shipping Containers	Size: 109L x 79W x 71H cm. (43x31x28 in), Weight: 150 kg (330 lbs.) Material: Sealed high impact polyurethane case

EdgeTech Topside Display Processor

Options	Diagnostics Kit (Video Display, Keyboard, Mouse), Spare Parts Kit, Optional Pulses
Main processor	SPARC Workstation
Operating System	UNIX
Display	17" Color Monitor
Operator Controls	A/D Gain, Two Stage TVG, Bottom Tracking, Digital Gain, Preamplifier Gain, Horizontal and Vertical Zoom, Direct Path Suppression, Swell Filter, Annotation
Video Displays	Bottom Tracking, Reflection Coefficient, Signal Amplitude, Navigation Map, Scale Lines, Track Lines
Navigation	NMEA 0183, X/Y, N/E, Navigation I/O Utility, Track lines, Event/Fix Marks, Sediment Classification Color vs. Echo Strength
Annotation	Keyboard, RS232 Port
Event Mark	Via Keyboard, Switch Closure, RS232 Port
Printer Support	EPC Models 9800, 8300, 1086, HSP-100, ODECO Model 850 & 1200F, Alden Model 9315 CTP, Ultra Model 183/200
Mass Storage	DAT
I/O Ports	Ethernet, Serial, SCSI, Parallel, Event Mark, Keyboard, Trackball, External Trigger In, Trigger Out, Heave Compensation Input
Power	105-125VAC or 210-250VAC, selectable, 47-63 Hz
Enclosure	Portable steel case suitable for transit. May be removed from cases and installed in 19-inch rack. Size: 50.3W x 50.3D x 15.3H cm. (19.8 x 19.8 x 6 in.), Weight: 32 kg (71 lbs.)
Environment	Temperature: Operating 5°C to 40°C Non-operating -40°C to 45°C. Humidity: Operating 20% to 80% relative humidity, non-condensing. Non-operating 5%-95%. Vibration: Normal ship environment.
Options	Spare Parts Kit, Replay Software, Ethernet Output of Data, Dual Mass Storage, Software Services Agreement

Specifications subject to change without notice.

EdgeTech®
THE SOUND SOLUTION

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MS750

Dual Frequency RTK Receiver for Precise Dynamic Positioning

Key features and benefits

- **20 Hz position update rate**
- **Less than 20 milliseconds position latency**
- **Centimeter-level position accuracy**
- **Front panel display & keypad for status monitoring and configuration**
- **User-defined local coordinates direct from receiver**
- **Industry standard CAN bus interface**

The MS750™ represents the highest level of accuracy and response available from a dual frequency GPS receiver. The receiver is specifically designed to allow the easy integration of reliable centimeter-level positions to any guidance or control application.

Dual Frequency RTK Receiver for Precise Dynamic Positioning

Accuracy and Response Times

Dynamic platforms, require virtually instantaneous position reports multiple times per second. The MS750 delivers positions to guidance or control loop software twenty times per second with a latency of less than 20 milliseconds. This responsiveness is matched with a horizontal accuracy of two centimeters and vertical accuracy of three centimeters. For the most precise applications, the MS750 provides one centimeter accuracy horizontally at a 5 Hz rate with a small increase in latency.

Interfacing and Configuration Ease

The MS750 is designed to plug right into your application with minimal development. An easy to-use application file interface enables the user to completely program receiver operation with a single command. Alternately, the receiver can be configured via the user-friendly built-in display and keyboard interface, or by the included Windows-based Configuration Toolbox software. Multiple configurations can be stored in the receiver as files and activated when desired. Local datum and transformation parameters may be loaded directly into the receiver. Therefore, output grid coordinates are compatible with GPS and traditional survey systems that may be in use on the same site. ASCII or Binary messages may be output through any of the three bi-directional serial ports. The receiver also includes support for the industry standard CAN (Controller Area Network) interface.

Advanced Technology

The accuracies, update rates and latencies available in the MS750 are made possible through a GPS architecture specifically designed for demanding dynamic positioning applications. Reliable operation in the most adverse environments, such as radio interference experienced at construction or mining sites, is a strict requirement. Custom designed hardware with Supertrak™ multibit GPS signal technology and Everest™ advanced multipath suppression provide superior tracking especially for weaker, low elevation satellites.

Both the RTCM format for differential GPS corrections and Trimble's published Compact Measurement Record (CMR) differential data can be received simultaneously, allowing the receiver to choose the optimum source and provide seamless navigation. Available as an option is the ability to calculate the baseline vector between two moving receivers to centimeter accuracy. The MS750 addresses a vast range of applications in the field of machine positioning, guidance and control.

Trimble

MS750

Dual Frequency RTK Receiver for Precise Dynamic Positioning

STANDARD FEATURES

- Centimeter accuracy, real-time positioning
- 20 Hz position updates
- < 20 ms position latency
- Front panel display & keypad
- User-defined local coordinates direct from receiver
- 3 serial I/O ports
- 2 CAN ports
- 1 PPS Output
- Trimble CMR Input/Output
- RTCM Input/Output
- One year hardware warranty
- Compact, easy mounting design
- Synchronized 5 Hz position updates

OPTIONS AND ACCESSORIES

- Moving Base RTK
- Rugged L1/L2 machine mount antenna
- Micro-Centered Antenna
- 5 m, 7.5 m, 10 m, 24 m & 30 m antenna cables
- Data extension cable
- Extended hardware warranty
- Firmware and Software update service

ORDERING INFORMATION

MS750 **Part Number 36577-00**

Includes MS750 receiver, Configuration Toolbox software, operating manual, power/data cable, data/1 PPS cable

PHYSICAL CHARACTERISTICS

Size	14.5cmW × 5.1cmH × 23.9cmD (5.7"W × 2.0" H × 9.4"D)
Weight	1.0 kg (2.25 lbs)
Power	12VDC/24VDC, 9 Watts

ENVIRONMENTAL CHARACTERISTICS

Operating temp	-20°C to +60°C
Storage temp	-30°C to +80°C
Humidity	MIL 810 E, Meth. 507.3 Proc III, Aggravated, 100% condensing
Vibration	MIL 810 D, Tailored Random 3gRMS Operating Random 6.2gRMS Survival
Mechanical Shock	MIL 810 D ± 40 g Operating ± 75 g Survival
EMC	
Radiated Emissions	CISPR 12
Conducted Emissions	SAE J1113/41
Radiated Immunity	ISO/DIS 13766, 30V/m
ESD	±15KV
Input Voltage Transients	ISO 7637-2

TECHNICAL SPECIFICATIONS

Tracking	9 channels L1 C/A code, L1/L2 full cycle carrier Fully operational during P-code encryption		
Signal processing	Supertrak Multibit Technology Everest Multipath Suppression		
Positioning mode	**Accuracy**[1]	**Latency**[2]	**Max Rate**
Synchronized RTK	1cm+ 2ppm Horizontal 2cm+ 2 ppm Vertical	300ms[3]	5 Hz Std
Low Latency	2cm+ 2ppm Horizontal[4] 3cm+ 2 ppm Vertical	< 20ms	20Hz
DGPS	< 1m	< 20ms	20Hz

[1] 1 sigma level
[2] At maximum output rate
[3] Dependent on data link throughput
[4] Assumes 1 second data link delay

Initialization	Automatic OTF (on-the-fly) while moving
Time required	Typically < 1 minute
Range	Up to 20 km from base for RTK
Start-up	< 90 seconds from power on to positioning < 30 seconds with recent ephemeris
Communications	3 × RS-232 ports. Baud rates up to 115,200 2 × CAN/J1939
Configuration	Via front panel display & keypad, Configuration Toolbox Software or user definable application files
Output Formats	NMEA-0183: GGK, GGA, ZDA, VTG, GST, PJT and PJK Trimble Binary Streamed Output

Trimble.

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YOUR LOCAL TRIMBLE OFFICE OR REPRESENTATIVE

Trimble 5700 GPS System

One receiver, many configurations, for greater flexibility and choice

The Trimble® 5700 GPS receiver is an advanced, but easy-to-use, surveying instrument that is rugged and versatile enough for any job.

Combine your 5700 with the antenna and radio that best suit your needs, and then add the Trimble controller and software of your choice for a total surveying solution. The powerful 5700 GPS system will provide all the advanced technological power and unparalleled flexibility you need to increase your efficiency and productivity in any surveying environment.

Advanced GPS receiver technology

The 5700 is a 24-channel dual-frequency RTK GPS receiver featuring the advanced Trimble Maxwell™ technology for superior tracking of GPS satellites, increased measuring speed, longer battery life through less power use, and optimal precision in tough environments. WAAS and EGNOS capability lets you perform real-time differential surveys to GIS grade without a base station.

Modular design for versatility

For topographic, boundary, or engineering surveying, clip the receiver to your belt, carry it in a comfortable backpack, or configure it with all components on a lightweight range pole. With the receiver attached to your site vehicle, you can survey a surface as fast as you can drive! For control applications, attach the receiver to a tripod...it's designed to work the way your job requires.

Full metal jacket...and lightweight

The 5700 GPS receiver boasts the toughest mechanical and waterproofing specs in the business. Its magnesium alloy case is stronger than aluminum, but also 30% lighter—the 5700 weighs just 1.4 kg (3 lb) with batteries. Whether you're collecting control points on a tripod, or scrambling down a scree slope collecting real-time kinematic data, the receiver is light enough and tough enough to carry on performing.

Fast and efficient data storage and communications

Use the receiver's CompactFlash memory to store more than 3,400 hours of continuous L1/L2 data collection at an average of 15-second intervals. Transfer data to a PC at speeds of more than 1 megabit per second through the super-fast USB port. Your choice of UHF radio modem is built in to the receiver to provide RTK communications receiving without the need for cables or extra power!

Your choice of Trimble antenna

Choose the high-accuracy Trimble GPS antenna that best suits your needs: the lightweight and portable Zephyr™ antenna for RTK roving, or the Zephyr Geodetic™ antenna for geodetic surveying.

The Zephyr Geodetic antenna offers submillimeter phase center repeatability and excellent low-elevation tracking, while the innovative design of its Trimble Stealth™ ground plane literally burns up multipath energy using technology similar to that used by stealth aircraft to hide from radar. The Zephyr Geodetic antenna thus provides unsurpassed accuracy from a portable antenna.

Key Benefits

- Industry-leading technology provides superior performance
- Flexible configurations put you in total control
- Rugged, high-performance hardware is built to last
- With the Trimble controller and software of your choice, enjoy seamless integrated surveying

Trimble 5700 GPS System

General

- Front panel for on/off, one-button-push data logging, CompactFlash card formatting, ephemeris and application file deletion, and restoring default controls
- LED indicators for satellite tracking, radio-link, data logging, and power monitoring
- Tripod clip or integrated base case

Performance specifications

Measurements

- Advanced Trimble Maxwell technology
- High-precision multiple correlator L1 and L2 pseudorange measurements
- Unfiltered, unsmoothed pseudorange measurement data for low noise, low multipath error, low time domain correlation, and high dynamic response
- Very low noise L1 and L2 carrier phase measurements with <1 mm precision in a 1 Hz bandwidth
- L1 and L2 Signal-to-Noise ratios reported in dB-Hz
- Proven Trimble low-elevation tracking technology
- 24 Channels L1 C/A Code, L1/L2 Full Cycle Carrier, WAAS/EGNOS.

Code differential GPS positioning[1]

Horizontal ... ±(0.25 m + 1 ppm) RMS
Vertical ... ±(0.5 m + 1 ppm) RMS
WAAS differential positioning accuracy typically <5 m 3DRMS[2]

Static and FastStatic GPS surveying[1]

Horizontal ... ±5 mm + 0.5 ppm RMS
Vertical ... ±5 mm + 1 ppm (× baseline length) RMS

Kinematic surveying[1]

Real-time and postprocessed kinematic surveys
Horizontal ... ±(10 mm + 1 ppm) (× baseline length) RMS
Vertical ... ±(20 mm + 1 ppm) RMS
Initialization time ... Single/Multi-base minimum 10 sec + 0.5 times baseline length in km, up to 30 km
Scalable GPS infrastructure initialization time ... <30 seconds typical anywhere within coverage area
Initialization reliability[3] ... Typically >99.9%

Hardware

5700 GPS receiver

Physical:
Casing ... Tough, lightweight, fully sealed magnesium alloy
Waterproof ... Tested to IPX7 standards
Shock and vibration ... Tested and meets the following environmental standards:
Shock ... MIL-STD-810F to survive a 1 m (3.28 ft) drop onto concrete
Vibration ... MIL-STD-810-F on each axis
Weight ... With internal batteries, internal radio, internal battery charger, standard UHF antenna: 1.4 kg (3 lb)
As entire RTK rover with batteries for greater than 7 hours, less than 4 kg (8.8 lb)
Dimensions (W×H×L) ... 13.5 cm × 8.5 cm × 24 cm (5.3 in × 3.4 in × 9.5 in)

Electrical:
Power ... DC input 11 to 28 V DC with over voltage protection
Power consumption ... 2.5 W receiver only, 3.75 W including internal radio
Battery ... Greater than 10 hours data logging, or greater than 7 hours of RTK operation on two internal 2.0 Ah lithium-ion batteries
Battery weight ... 0.1 kg (3.5 oz)
Battery charger ... Internal with external AC power adapter; no requirement for external charger
Power output ... 11.5 to 20 V DC (Port 1), 11.5 to 27.5 V DC (Port 3) on external power input
Certification ... Class B Part 15 FCC certification, CE Mark approved, C-Tick approved, Canadian FCC

Environmental:
Operating temperature[4] ... -40 °C to 65 °C (-40 °F to 149 °F)
Storage temperature ... -40 °C to 80 °C (-40 °F to 176 °F)
Humidity ... 100%, condensing

Communications and data storage:

- 2 external power ports, 2 internal battery ports, 3 RS232 serial ports
- Integrated USB for data download speeds in excess of 1 Mb per second
- External GPS antenna connector
- CompactFlash advanced lightweight and compact removable data storage. Options of 64 MB or 128 MB from Trimble
- More than 3,400 hours continuous L1+L2 logging at 15 seconds with 6 satellites typical with 128 MB card
- Fully integrated, fully sealed internal UHF radio modem option
- GSM, cellphone, and CDPD modem support
- Dual event marker input capability
- 1 Hz, 2 Hz, 5 Hz, and 10 Hz positioning and data logging
- 1 pulse per second output capability
- CMRII, CMR+, RTCM 2.x and 3.x input and output standard
- 14 NMEA outputs

Zephyr antenna

Dimensions ... 16.2 cm (6.38 in) diameter × 6.2 cm (2.44 in) height
Weight ... 0.55 kg (1.20 lb)
Operating temperature ... -40 °C to 70 °C (-40 °F to 158 °F)
Humidity ... 100% humidity proof, fully sealed
Shock and vibration ... Tested and meets the following environmental standards:
Shock ... MIL-STD-810-F to survive a 2 m (6.56 ft) drop onto concrete
Vibration ... MIL-STD-810-F on each axis

- 4-point antenna feed for submillimeter phase center repeatability
- Integral low noise amplifier
- 50 dB antenna gain

Zephyr Geodetic antenna

Dimensions ... 34.3 cm (13.5 in) diameter × 7.6 cm (3 in) height
Weight ... 1.31 kg (2.88 lb)
Operating temperature ... -40 °C to 70 °C (-40 °F to 158 °F)
Humidity ... 100% humidity proof, fully sealed
Shock and vibration ... Tested and meets the following environmental standards:
Shock ... MIL-STD-810-F to survive a 2 m (6.56 ft) drop onto concrete
Vibration ... MIL-STD-810-F on each axis

- 4-point antenna feed for submillimeter phase center repeatability
- Integral low noise amplifier
- 50 dB antenna gain
- Trimble Stealth ground plane for reduced multipath

1 Accuracy may be subject to conditions such as multipath, obstructions, satellite geometry, and atmospheric parameters. Always follow recommended survey practices.
2 Depends on WAAS/EGNOS system performance.
3 May be affected by atmospheric conditions, signal multipath, and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
4 Receiver operates normally to –40 °C (–40 °F) but some office-based functions such as USB download or internal battery charging are not recommended at temperatures below freezing.
Specifications subject to change without notice.

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MODEL 455

DESCRIPTION

The Innerspace Technology Model 455 Survey Depth Sounder provides analog and digital depth on high resolution LCD display screens. The small, lightweight unit is ideal for use on small boats for hydrographic and GIS surveys, and also has applications on general purpose workboats and Corps of Engineers reconnaissance vessels. The 455 has most of the capabilities of Innerspace's legendary thermal printing depth sounder recorders, except for the thermal chart recording, plus it has many new features. Designed with the operator in mind, the easy-to-use menu is controlled via up / down, left / right arrows; no numerical entries are required and, when power is turned off, all entries are saved for next power on. In the operation mode, operator entries are always in view on the LCD display screen, along with the large numeral, digitized depth. The 455's analog display provides a continuous, high resolution bottom profile with alphanumerical annotation of pertinent information including: Speed-of-Sound, Tide, Draft, Time and Fix Number. For a hard copy, a screen print of the analog data may be sent to a standard computer printer or it can be stored internally on a 24 or 48 mb integrated circuit for later recall.

SPECIFICATIONS

GRAPHIC DISPLAY

- 640 x 480 Pixel Monochrome Transflective LCD with Backlight and Contrast Control
- 5 ¾ in. x 4 ¾ in. viewing area
- Emulates paper chart recorder

NUMERIC DISPLAY

- 4 lines x 40 characters with large 1 in. high numerics and Backlight

OPERATION

- Menu driven parameter selection on alphanumeric display

PARAMETER SELECTION

- Speed-of-Sound, Tide, Draft, Gate Width, Scale, Backlight, Com Ports and many more

RESOLUTION

- .1 Unit graphic and numeric

DEPTH RANGES

- 0-45, 40-85, 80-125, 120-165, 160-205 Feet or Meters (dm and cm selection)
- Multipliers: 1, 2, 10
- Auto Ranging

ANNOTATION

- LCD graphic display numerically displays Speed-of-Sound, Tide, Draft, Date, Time, Depth, Fix number and GPS Data

TRANSMITTER

- Front panel switch selectable power levels: 250 watts to 10 watts in 4 levels

RECEIVER

- Time varied automatic gain adjustment under microprocessor control 20 or 30 Log
- Front panel manual gain control 20db
- Adjustable Blanking

DIGITIZER

- Range Gated (selectable widths)
- Initial Depth Entry
- 4 Modes of Operation
- Gate Mark on Graphic Display

UTILITIES

- Depth Simulator
- Chart Speed
- Screen capture to memory

INPUTS/OUTPUTS

- RS232 Port A
- RS232 Port B
- RS232 Port C
- Parallel Port
- Keyboard and VGA Port
- GPS Antenna with GPS option
- Floppy Port

TRANSDUCER

- 200kHz 8°
- Optional: 200kHz 3°

POWER

- 12VDC, 2½ Amp

ENCLOSURE

- Drawn aluminum case
- Aluminum panel painted to resist corrosion.
- Removable handle and soft carry bag included.

OVERALL SIZE

- 13 in. Wide x 9 in. High x 9 in. Deep
- 38.1 cm Wide x 22.86 High x 22.86 Deep

WEIGHT

- 15 lb.
- 6.8 kg

OPTIONS:

- Heave sensor
- Remote VGA display
- Tabletop / overhead mounting bracket
- Custom annotation (1 Line 40 Characters)
- Remote readout (large numeric)
- Continuous analog storage, 48mb
- AC power supply
- Portable transducer mounts
- Floppy Disk Drive in travel case
- Mini keyboard (89 key) and adapter cable
- 125 kHz transceiver and transducer 125kHz 7º
- Laplink software
- Color graphic display

CENTURION™ Splash Proof

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AUV and ROV System

Sea Scan® PC Side Scan Sonar System Information/Specifications Sheet

GENERAL

Sea Scan® PC is a high-resolution side scan sonar system designed to locate large and small objects underwater as well as display bottom information used for biological research and survey operations. The system provides a near photographic sonic image, regardless of underwater visibility, and employs a state of the art personal computer (PC) for all control, display, analysis and storage functions. This sheet provides operating information and system specifications for all systems manufactured by Marine Sonic Technology, Ltd. (MSTL).

MSTL manufactures the Sea Scan® PC as a Towed System, AUV/ROV System, Submerged System, and as a combination Sea Scan® PC system and Geometrics Magnetometer known as the MagScan®. In addition, MSTL is a leader in custom side scan sonar applications, working with customers to meet their unique and demanding custom installations.

The towed system is MSTL's basic and most popular system. It is available in several different models with each providing near picture quality images, ease of operation, a powerful software package, dependability and affordability. MSTL also offers the Sea Scan® PC system components miniaturized for AUV/ROV applications. The system's electronics card is available as an ISA or PC104 card and the single and dual frequency transducers have been streamlined and miniaturized for AUV/ROV applications.

Two additional and unique side scan sonar systems produced by MSTL are the Submerged System (non-towed) and the MagScan® System (towed). The Submerged System was designed and developed to meet the requirements for a side scan sonar system, which could be operated underwater. A diver inside a wet underwater vehicle can easily operate the system.

FIELDWORKS Portable System

Submerged System

The second unique system is the MagScan ○, which is manufactured in conjunction with Geometrics®, Inc. This system combines, in one towfish, the Sea Scan® PC system and the Geometrics® G-880 magnetometer. This unique combination allows for collection and display of real time sonar images and magnetometer data on the same screen.

Sea Scan® PC systems are used worldwide by law enforcement agencies including the U.S. Customs Service, state and city police departments, sheriffs departments, fire departments, dive teams and naval military forces. Additional Sea Scan® PC systems are employed by treasure hunters, oil companies, diving and salvage companies, survey companies, and major universities for archaeological and biological research.

MSTL has designed and manufactured custom configurations to meet unique customer needs. Some special configurations completed are:

- U.S. Customs Service for detecting illegal drug shipments.
- Woods Hole Oceanographic Institution for use in autonomous underwater vehicle (AUV) research.
- Submerged system for wet underwater manned operations.
- A dual frequency (150-600 kHz) deep system for use aboard the U.S. Navy's research submarine NR-1.
- Several 600 kHz modular transducer sets rated to Full Ocean depth.

Sea Scan® PC is a registered trademark and U.S.Patents 5,142,502 and 5,142,503 cover all equipment.

SYSTEM DESCRIPTIONS

TOWED SYSTEMS

A complete Sea Scan® PC towed system consists of a personal computer, LCD flat panel display, keyboard, mouse, two specially designed towcables and a single frequency towfish. In addition, an operator's manual, small tool kit, asset of towcable line weights, five (5) hours of factory training and a one year limited warranty are part of the system. All components are shipped in rugged, foam lined, shipping containers. The system is covered by a one year limited warranty. A complete towed system with the shipping containers weighs, on average, 100 kg (220 lbs.).

The Sea Scan® PC towed system is available in three different configurations:

- A Desktop Sea Scan® PC system includes a rack mount case computer with Windows Me and an Intel™ based Pentium™ III processor or equivalent CPU. Additional features: 256 MB RAM, 60 GB hard drive, 3.5" floppy drive, internal R/RW CD drive, wireless mouse and keyboard, associated power cords and a 15" LCD flat panel monitor.
- A Portable Sea Scan® PC system includes a portable PC (SBS 904 or Fieldworks 8000) containing a CELERON/Intel™ Pentium™ processor with 32/64 MB RAM, a 30/6 GB hard

drive, 3.5"/CD Rom internal drive, mouse, keyboard, associated power cords and a color active display. Neither system is considered either "Splash-proof" or "Water-proof".

- The "CENTURION"© Splash Proof Sea Scan® PC system, designed and manufactured by MSTL, includes a small rugged case containing a 233 MHz CPU, 128 MB RAM, a 20 GB hard drive, increased connectivity and network/USB compatible. The system comes with a keyboard and waterproof mouse, an external GARMIN "eTrex" Legend GPS plus a second JRC D/GPS system and external R/RW CD-ROM drive. The "CENTURION"© features a 10.4" daylight readable screen for easier target recognition and detection. All external connections are splash proof. The unit has been designed for open boat operations in a rain and seawater spray environment. The system normal operates from a 12 VDC battery source. Computer dimensions are 13" x 11" x 6" and weight is 12 pounds.

Towfish

Each of the Sea Scan® PC systems contain one single frequency towfish available in the following frequencies: 150, 300, 600, 900, or 1200 kHz. The towfish is certified to an operating depth of 300-meters (984-ft.).

- The fish is constructed of solid polyvinyl chloride (PVC) and other non-corrosive materials.

TOWFISH SPECIFICATIONS

kHz	150	300	600	900	1200
Length (m/in)	1.1/42	1.1/42	1.1/42	1.1/42	1.1/42
Diameter (cm/in)	10.2/4	10.2/4	10.2/4	10.2/4	10.2/4
Weight in air (kg/lbs.)	16.8/37	15.9/35	15/33	15/33	15/33
Pulse Length (μsec/cycles)	33/5	20/6	10/6	6.7/6	5/6
Typical Range Resolution – (cm/in)	58/23(300)	29/11.4(150)	9.7/3.8(50)	7.8/3(40)	3.9/1.5(20)
Axial Resolution – aperture size (cm/in)	61/24	61/24	30.5/12	22.9/9	15.2/6
Typical Maximum Range (meters)	400-500	200-300	100	40	20

Towcables

- A 100 and 30-meter cable are standard with the towed system. Optional lengths are available up to 800 meters depending on the transducer frequency operating with the cable.

- The cable is constructed using three custom coaxial cables and a 545-kg (1250 lbs.) braided Kevlar ™ strength member covered by either a polyurethane or polyethylene outer jacket to a nominal cable diameter of approximately 0.36" or less.

- 100-meters of cable weighs 9.1 kg (20 lbs.) in air, 4.1 kg (9 lbs.) in water.

- The minimum safe bending radius is 13 cm (5 in.)

Splash Proof Battery Box – The Splash Proof System can be ordered with a self-contained battery box that provides a 12 VDC power source for 8 hrs of scanning operations. The battery box contains a charger and four 12 VDC closed cell batteries.

Removable Media Discs – Desktop models include a built in a R/RW CD drive capable of storing up to 650 MB and a 3.5" internal drive. With the R/RW CD drive the customer can quickly transfer large quantities of image data to other computers for analysis or archive purposes. Since the Sea Scan® PC system operates in a PC, virtually any mass storage device available will interface with the system.

Additional Towfish – One single frequency towfish comes standard with each towed system. Additional frequency towfish should be considered to maximize the capabilities of the system and to provide a backup in case of loss or damage to the primary towfish. A combination that works well together is to have a long-range towfish (150 – 300 kHz) and a high-resolution shorter-range towfish (600, 900 or 1200 kHz). It takes only a few minutes to retrieve and change to a different towfish.

Spare Towcables – Two cables (100-meter and 30-meter) come standard with each towed system. When scanning depths are greater than 50-meters, a cable length longer than 100-meters is needed. Cable lengths up to 800-meters are available, depending on the transducer frequency being used.

12 VDC to 115 VAC Inverters – Several of the Sea Scan® PC systems require 115 or 230 VAC power from either an onboard generator or a DC to AC inverter. High quality inverters are available, which are fully tested for noise free operation.

Analog Output – In certain situations a real time hard copy printout of the images is desired. MSTL offers an analog output capability for operation with a paper recorder on our Desk Top and Portable systems. This option is not available with the Centurion ™.

SEA SCAN® PC SYSTEM FEATURES:

All sonar functions, regardless of the Sea Scan® PC system, are software controlled. The features listed below apply to all systems manufactured by MSTL.

Controls:

- **Power** – Selectable on/off
- **Acoustic Range Scales** - 5, 10, 20, 50, 75, 100, 150, 200, 300, 500 meters (Range listed is out from each side of the transducer. Multiply x 2 to determine total swath scanned). Additional ranges of 30 and 40-meters are available where the PC 104 card is installed.
- **Magnetometer Range Scales** (Only applicable to MagScan System) -1/10, 1/20, 1/50, 10/50, 10/100, 20/100, 50/500, 100/500, gamma per division.
- **Display Color Scales** - Gray, Brown, Bronze, Gold, Mixed, HSV, Hot, Pink, Cool, Bone, Jet, Copper, and Custom. All color scales can be viewed inverted.
- **Time Gain Compensation** (TGC) – Automatic or manual.
- **Speed Control** – Automatically controlled with GPS/DGPS input or manual input.

- **Zoom** – Click and drag zoom window or centered. Both support multiple zooms.
- **Length Measurement** – Distances measured on images in feet, yards, or meters.
- **Area Measurement** – Areas measured in square feet, yards, or meters.
- **Height Measurement** – Shadows created by objects, displayed in the images, can be triangulated to determine height above the sea floor.
- **Channel Selection** – Displays either left or right channels or both left and right channels.
- **Annotations** – Notes regarding details of observed images can be added to images in real time or during post processing analysis.
- **Markers** – Objects in the acoustic image or anomalies in the magnetometer strip chart can be marked in the plotter, which stores the target location, target height, water depth and the magnetic field of information for post analysis. All data is stored in a text file
- **Event Markers** – Event markers can be input by an external source via the serial port or automatically by the system software using selectable ranges.
- **Range Delay** – Range scales can be delayed to eliminate the water column or offset range for optimum viewing/collection.
- **Navigation Plotter** – The integrated full-featured navigation plotter correlates all acoustic information to geographic positions. Up to 100 navigation waypoints can be entered into the plotter. Objects in the acoustic image can be quickly transferred to the plotter. Plotter information can be displayed simultaneously and overlaid on the sonar image in real time.
- **Filter** – More than 50 mathematical filters are available to enhance the acoustic images. These filters are located in the Sea Scan® PC Review Program.

<u>Inputs</u>

- **Desktop Systems** – Operate on either 115 or 230 VAC.
- **Portable and MagScan® Systems** – Operate on either 115/230 AC and/or 12 VDC. Operating voltage depends on the model selected.
- **"Centurion" Splash Proof-** Operates on 12 VDC.
- **AUV and Submerged Systems** – Operate on voltages from 10 to 36 VDC (5.5 amps at 12 VDC, 2.5 amps at 24 VDC)
- **Navigation Input** – Accepts a NEMA 0183 stream from the GPS/DGPS.
- **Analog Inputs** – The towfish provides analog image data that is converted, displayed and stored as digital data.
- **Host/Remote Control** – This feature allows the system, installed in an AUV/ROV, to be controlled from a remote computer using a standard serial port communication.
- **Fathometer** – Water depth data can be input into the system from a Fathometer outputting a NEMA 0183 depth information string. This information can be inputted into the computer from the Fathometer through a standard serial port communication. The depth data can be displayed onscreen overlaid on the image.
- **Event Markers** – Either the operating system or an external source using the standard serial port communication can enter event markers.

<u>Outputs</u>

- **Acoustic Data** – All acoustic data is stored digitally in a MST file format.
- **TIFF Files** – Images can be converted to the standard TIFF file format from the Sea Scan® PC Review Program for use in publishing programs.
- **Navigation Data** – All navigation information is stored digitally in the SVY (Survey) file format (text file).

- **Fathometer Data** – All Fathometer data is stored digitally in the DPT (Depth) file format (text file).
- **Marker** – All marker information is stored digitally in the MKR format (text file).
- **Magnetometer Data** – All magnetometer data is stored digitally in the MAG file format (text file).
- **Printer** – Images can be printed from any PC compatible printer.
- **Analog Output** – As an option, analog output can be provided so that real time, hard copy images can be printed during scanning operations.

Revised September 9, 2002

Appendix B

Side Scan Sonar Ground Truthing Logs and Lab Analysis

Location	Easting	Northing	Sample ID	Date	USCS Symbol	Color Designation	Description
GSD-001	589164.22	708505.25	GSD-001-0.0-0.5	5/2/2005	SM	5YR 3/2	Grayish brown fine sand, some silt w/ some gravel
GSD-002	589388.99	708350.71	GSD-002-0.0-0.5	5/2/2005	SM	5YR 4/1	Brownish gray fine sand and silt w/ some medium gravel
GSD-003	589253.49	708420.52	GSD-003-0.0-0.5	5/2/2005	SP	5YR 4/1	Brownish gray medium to coarse sand, some gravel
GSD-004	589201.04	708471.74	GSD-004-0.0-0.5	5/2/2005	SP	5YR 3/2	Grayish brown medium to fine sand, some silt / leaves
GSD-005	589306.57	708381.37	GSD-005-0.0-0.5	5/2/2005	GP	5YR 4/1	Brownish gray coarse grave to coarse sand
GSD-006	589363.17	711005.88	GSD-006-0.0-0.5	5/2/2005	ML	10Y 4/2	Dark gray olive silt, some coarse gravel
GSD-007	589631.04	710976.14	GSD-007-0.0-0.5	5/2/2005	ML	10Y 4/2	Dark gray olive silt
GSD-008	589502.14	710990.62	GSD-008-0.0-0.5	5/2/2005	SP	5YR 4/1	Brownish gray medium to coarse sand
GSD-009	589427.4	711000.27	GSD-009-0.0-0.5	5/2/2005	SP	5YR 3/2	Grayish brown medium to coarse sand w/ gravel
GSD-010	589568.16	710984.46	GSD-010-0.0-0.5	5/2/2005	SW	5YR 4/1	Brownish gray fine sand, trace silt
GSD-011	590542.34	713406.31	GSD-011-0.0-0.5	5/2/2005	ML	10Y 4/2	Grayish olive silt w/ coarse sand and large gravel
GSD-012	590786.35	713239.45	GSD-012-0.0-0.5	5/2/2005	ML	5YR 3/2	Grayish brown silt
GSD-013	590672.08	713347.55	GSD-013-0.0-0.5	5/2/2005	SW	5YR 4/1	Brownish gray fine sand
GSD-014	590631.54	713383.44	GSD-014-0.0-0.5	5/2/2005	SW/SM	5YR 4/2	Brownish gray fine and medium sand, some silt
GSD-015	590727.36	713307.34	GSD-015-0.0-0.5	5/2/2005	SW/SM	5YR 4/3	Brownish gray fine and medium sand, some silt
GSD-016	591952.81	715654.54	GSD-016-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt
GSD-017	592171.2	715507.47	GSD-017-0.0-0.5	5/3/2005	GP/GM	5YR 3/2	Grayish brown medium coarse gravel (gravel up to 1") and 20% silt
GSD-018	592062.07	715581.94	GSD-018-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ some fine gravel
GSD-019	592015.33	715615.44	GSD-019-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown medium coarse gravel and silt
GSD-020	592117.21	715553.32	GSD-020-0.0-0.5	5/3/2005	GP	5YR 4/1	Brownish gray medium coarse gravel (up to 1"), trace medium sand
GSD-021	591730.32	718076.35	GSD-021-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ coarse gravel up to 0.5"
GSD-022	592012.39	718124.55	GSD-022-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ little to some fine sand
GSD-023	591876.8	718090.31	GSD-023-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-024	591805.15	718079.08	GSD-024-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ medium fine sand trace gravel
GSD-025	591943.7	718099.19	GSD-025-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ trace fine sand
GSD-026	592045.7	720720.38	GSD-026-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ organic matter / trace gravel up to 1"
GSD-027	592323.95	720687.08	GSD-027-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ slight organic / trace gravel
GSD-028	592214.58	720730.62	GSD-028-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-029	592133.13	720732.58	GSD-029-0.0-0.5	5/3/2005	GW/GM	5YR 3/2	Grayish brown coarse gravel, sand w/ silt
GSD-030	592277.76	720724.53	GSD-030-0.0-0.5	5/3/2005	SW/SM	5YR 3/2	Grayish brown fine sand - silt
GSD-031	592787.6	723329.39	GSD-031-0.0-0.5	5/3/2005	SM	5YR 3/2	Grayish brown medium to fine silt-sand, some gravel up to 1"
GSD-032	592918.78	723051.73	GSD-032-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ trace sand
GSD-033	592857.78	723180.16	GSD-033-0.0-0.5	5/3/2005	SP	5YR 3/2	Grayish brown fine to medium sand
GSD-034	592838.02	723243.48	GSD-034-0.0-0.5	5/3/2005	SP	5YR 3/2	Grayish brown fine to medium sand
GSD-035	592885.45	723121.45	GSD-035-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ some organic / some sand
GSD-036	595495.31	724276.83	GSD-036-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ some fine sand / slight gravel up to 0.5"
GSD-037	595669.77	724108.63	GSD-037-0.0-0.5	5/3/2005	SM	5YR 3/2	Grayish brown fine sand w/ large gravel (up tp 1") little to some silt
GSD-038	595587.72	724155.53	GSD-038-0.0-0.5	5/3/2005	SP	5YR 3/2	Grayish brown fine to medium sand, little fine sand
GSD-039	595559.13	724217.47	GSD-039-0.0-0.5	5/3/2005	SW	5YR 3/2	Grayish brown medium sand - silt
GSD-040	595605.66	724113.55	GSD-040-0.0-0.5	5/3/2005	GP	5YR 3/2	Grayish brown fine - medium sand coarse gravel, trace silt
GSD-041	596583.13	726215.4	GSD-041-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt fine to medium sand, trace gravel
GSD-042	596746.52	726151.45	GSD-042-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt w/ somw gravel up to 1"

Location	Easting	Northing	Sample ID	Date	USCS Symbol	Color Designation	Description
GSD-043	596660.91	726183.8	GSD-043-0.0-0.5	5/3/2005	GP	5YR 3/2	Grayish brown medium coarse gravel, trace silt
GSD-044	596627.67	726202.27	GSD-044-0.0-0.5	5/3/2005	SP	5YR 3/2	Grayish brown, top 3" fine medium sand, 3" clayey silt (10 YR 5/4)
GSD-045	596711.56	726172.88	GSD-045-0.0-0.5	5/3/2005	GW	5YR 3/2	Grayish brown medium coarse gravel, some fine sand
GSD-046	596774.15	728692.08	GSD-046-0.0-0.5	5/3/2005	MH	5YR 3/2	Grayish brown silt w/ some organic material
GSD-047	596956.9	728809.59	GSD-047-0.0-0.5	5/3/2005	MH	5YR 3/2	Grayish brown silt w/ fine sand and gravel
GSD-048	596872.39	728751.77	GSD-048-0.0-0.5	5/3/2005	SM	5YR 3/2	Grayish brown coarse sand and gravel, some trace silt
GSD-049	596833.66	728716.35	GSD-049-0.0-0.5	5/3/2005	MH	5YR 3/2	Grayish brown silt
GSD-050	596909.98	728779.42	GSD-050-0.0-0.5	5/3/2005	SW	5YR 3/2	Grayish brown fine sand, some silt w/ organicl
GSD-051	587481.55	706461.81	GSD-051-0.0-0.5	5/3/2005	MH	5YR 3/2	Grayish brown silt w/ trace gravel
GSD-052	587798.56	706255.81	GSD-052-0.0-0.5	5/3/2005	MH	5YR 3/2	Grayish brown silt w/ trace fine sand
GSD-053	587636.64	706363.36	GSD-053-0.0-0.5	5/3/2005	SP	5YR 3/2	Grayish brown fine to medium sand, some silt
GSD-054	587544.81	706407.27	GSD-054-0.0-0.5	5/3/2005	SM	5YR 3/2	Grayish brown silty fine sand
GSD-055	587707.65	706282.87	GSD-055-0.0-0.5	5/3/2005	SM	5YR 3/2	Grayish brown silty sand, some gravel
GSD-056	586604.57	703967.28	GSD-056-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt
GSD-057	586883.88	703819.71	GSD-057-0.0-0.5	5/3/2005	SP/SM	5YR 3/2	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-058	586745.11	703889.7	GSD-058-0.0-0.5	5/3/2005	SP/SM	5YR 3/2	Grayish brown fine - coarse sand, some silt
GSD-059	586662.26	703939.65	GSD-059-0.0-0.5	5/3/2005	SM	5YR 3/2	Grayish brown sandy silt
GSD-060	586823.81	703872.16	GSD-060-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt
GSD-061	596121.47	731241.1	GSD-061-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt
GSD-062	596337.32	731164.74	GSD-062-0.0-0.5	5/3/2005	SW	10YR 5/4	Moderate yellowish brown coarse sand and trace gravel
GSD-063	596233.56	731210.56	GSD-063-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown fine silt, fine sand, organic matter
GSD-064	596181.14	731231.89	GSD-064-0.0-0.5	5/3/2005	ML	10YR 5/4	Moderate yellowish brown, Grayish brown fine silt - sand
GSD-065	596277.99	731184.44	GSD-065-0.0-0.5	5/3/2005	ML	5YR 3/2	Grayish brown silt, trace organics
GSD-066	596826.15	733771.9	GSD-066-0.0-0.5	5/4/2005	SW	5YR 3/2	Grayish brown silty fine sand slight coarse gravel up to 1", trace organics
GSD-067	597037.92	733696.99	GSD-067-0.0-0.5	5/4/2005	SP	5YR 3/2	Grayish brown coarse sand - silt, trace gravel
GSD-068	596941.04	733725.65	GSD-068-0.0-0.5	5/4/2005	SW	5YR 3/2	Grayish brown fine sand, some organic material
GSD-069	596892.77	733735.75	GSD-069-0.0-0.5	5/4/2005	SW/SM	5YR 3/2	Grayish brown fine sand, silt w/ trace light brown sand
GSD-070	596988.94	733709.87	GSD-070-0.0-0.5	5/4/2005	SW/SM	5YR 3/2	Grayish brown fine sand - silt, trace organic material
GSD-071	597267.82	736233.61	GSD-071-0.0-0.5	5/4/2005	SW	5YR 3/2	Grayish brown fine sand - coarse gravel (up to 1/2"), shell fragments, organic material
GSD-072	597442.96	736272.93	GSD-072-0.0-0.5	5/4/2005	SM	10YR 5/4	Moderate yellowish brown, Grayish brown silty sand, coarse gravel to 1"
GSD-073	597399.61	736189.6	GSD-073-0.0-0.5	5/4/2005	SP	5YR 3/2	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-074	597322.15	736241.54	GSD-074-0.0-0.5	5/4/2005	SP	10YR 5/4	Moderate yellowish brown, Grayish brown coarse sand, gravel up to 1", slight organic
GSD-075	597410.37	736271.4	GSD-075-0.0-0.5	5/4/2005	SP	10YR 5/4	Moderate yellowish brown, Grayish brown coarse sand, gravel up to 0.5"
GSD-076	598175.27	738524.78	GSD-076-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown silt w/ gravel up tp 1"
GSD-077	598184.9	738345.07	GSD-077-0.0-0.5	5/4/2005	SW	5YR 3/2	Grayish brown fine sand - silt, organic material
GSD-078	598186.82	738417.91	GSD-078-0.0-0.5	5/4/2005	SP	5YR 3/2	Grayish brown fine - coarse sand, trace organics
GSD-079	598185.38	738477.6	GSD-079-0.0-0.5	5/4/2005	CL	10Y 4/2	Grayish olive - grayish brown clayey material - medium stiff (5YR 3/2)
GSD-080	598189.83	738382.5	GSD-080-0.0-0.5	5/4/2005	OL	5YR 3/2	Grayish brown fine sand, trace oragnics, wood material
GSD-081	599670.28	736782.57	GSD-081-0.0-0.5	5/4/2005	OL	5YR 3/2	Grayish brown fine sand, trace oragnics
GSD-082	599643.95	736654.07	GSD-082-0.0-0.5	5/4/2005	OL/OH	5YR 3/2	Grayish brown fine sand, trace oragnics, coarse gravel, rocks
GSD-083	599660.29	736706.87	GSD-083-0.0-0.5	5/4/2005	SP	5YR 3/2	Grayish brown coarse sand, gravel up to 1"

Location	Easting	Northing	Sample ID	Date	USCS Symbol	Color Designation	Description
GSD-084	599658.59	736755.54	GSD-084-0.0-0.5	5/4/2005	SP	5YR 3/2	Grayish brown coarse sand, gravel up to 1/2"
GSD-085	599643.9	736679.45	GSD-085-0.0-0.5	5/4/2005	GP/GC	10YR 5/4	Moderate yellowish brown, Grayish brown large rocks, gravel, clay (5YR 3/2)
GSD-086	600759.97	738634.4	GSD-086-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-087	600892.75	738613.86	GSD-087-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-088	600830.93	738613.89	GSD-088-0.0-0.5	5/4/2005	GP	5YR 3/2	Grayish brown coarse sand, gravel up to 1"
GSD-089	600805.12	738620.18	GSD-089-0.0-0.5	5/4/2005	GP	5YR 3/2	Grayish brown coarse sand, gravel up to 1"
GSD-090	600865.97	738613.1	GSD-090-0.0-0.5	5/4/2005	GP	5YR 3/2	Grayish brown coarse sand, gravel up to 1"
GSD-091	585192.09	701738.33	GSD-091-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown silt, slight coarse gravel
GSD-092	585492.32	701592.07	GSD-092-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown silt, trace organics
GSD-093	585330.5	701666.44	GSD-093-0.0-0.5	5/4/2005	ML	10Y 4/2	Grayish olive, grayish brown silt w/ some sand (5YR 3/2)
GSD-094	585256.54	701701.7	GSD-094-0.0-0.5	5/4/2005	ML	10Y 4/2	Grayish olive, grayish brown silt (5YR 3/2)
GSD-095	585410.84	701640.3	GSD-095-0.0-0.5	5/4/2005	ML	10Y 4/2	Grayish olive silt w/ fine sand and slight organic
GSD-096	584777.6	699083.49	GSD-096-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown silt w/ trace coarse sand
GSD-097	585061.03	699041.71	GSD-097-0.0-0.5	5/4/2005	ML	5YR 3/2	Grayish brown silt w/ slight organics
GSD-098	584917.1	699056.74	GSD-098-0.0-0.5	5/4/2005	SC	5YR 3/2	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material (5YR 6/4)
GSD-099	584846.48	699080.97	GSD-099-0.0-0.5	5/4/2005	SP	5YR 3/2	Grayish brown coarse sand - gravel, wood fragments, organic material
GSD-100	584980.2	699057.08	GSD-100-0.0-0.5	5/4/2005	OL	5YR 3/2	Grayish brown, mostly organic wood material, slight fine silty sand
GSD-101	597175.17	683165.2	GSD-101-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt
GSD-102	597554.28	683324.72	GSD-102-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ coarse sand
GSD-103	597378.6	683249.81	GSD-103-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive fluffy silt
GSD-104	597285.04	683215.71	GSD-104-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive fluffy silt
GSD-105	597494.91	683293.01	GSD-105-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive fluffy silt
GSD-106	596550.9	685791.3	GSD-106-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ coarse gravel
GSD-107	598346.51	686113.87	GSD-107-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-108	597509.89	685974.66	GSD-108-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-109	597063.72	685909.09	GSD-109-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ medium sand
GSD-110	597825.53	686078.35	GSD-110-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ a small amount of medium sand
GSD-111	596968.62	688759.47	GSD-111-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-112	597596.92	688557.86	GSD-112-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ a small amount of medium sand
GSD-113	597325.97	688665.97	GSD-113-0.0-0.5	5/5/2005	OL	10Y 4/2	Dark gray, olive mainly organic matter w/ fine silt
GSD-114	597170.74	688734.55	GSD-114-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-115	597485.55	688679.92	GSD-115-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-116	597534.58	691002.93	GSD-116-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-117	598142.04	690865.22	GSD-117-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-118	597915.18	690917.32	GSD-118-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ some organic matter
GSD-119	597754.66	690946.83	GSD-119-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-120	598033.02	690928.88	GSD-120-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-121	597998.42	693535.72	GSD-121-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-122	598511.82	693530.93	GSD-122-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ a small amount of coarse sand
GSD-123	598251.58	693531.95	GSD-123-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ fine sand and organic matter
GSD-124	598128.83	693529.44	GSD-124-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ fine sand
GSD-125	598402.62	693538.02	GSD-125-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ fine and medium sand

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GSD-126	596318.74	695290.13	GSD-126-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ some organic matter
GSD-127	596465.68	695797.58	GSD-127-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-128	596275.52	695601.8	GSD-128-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ some medium sand
GSD-129	596228.02	695451.78	GSD-129-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ some organic matter
GSD-130	596280.53	695723.72	GSD-130-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ some medium sand and organic matter
GSD-131	594134.85	695159.43	GSD-131-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-132	594092.1	695675.31	GSD-132-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-133	594118.17	695435.09	GSD-133-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive coarse gravel and coarse sand w/ silt
GSD-134	594142.61	695323.22	GSD-134-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-135	594111.65	695560.88	GSD-135-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-136	591701.67	694593.44	GSD-136-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt
GSD-137	591508.91	694856.9	GSD-137-0.0-0.5	5/5/2005	ML	10Y 4/2	Grayish olive silt clay w/ medium sand
GSD-138	591605.2	694715.16	GSD-138-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ fine sand
GSD-139	591648.68	694659.8	GSD-139-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ fine sand
GSD-140	591538.67	694809.28	GSD-140-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray, olive silt w/ some fine sand
GSD-141	590079.41	692457.78	GSD-141-0.0-0.5	5/5/2005	SP	5YR 4/1	Brownish gray well mixed coarse sand and fine gravel and coarse gravel
GSD-142	589921.98	692817.6	GSD-142-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ some fine sand
GSD-143	590008.61	692633.08	GSD-143-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ some fine sand
GSD-144	590023.65	692532.66	GSD-144-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ some fine and sand - sheen
GSD-145	589968.6	692735.53	GSD-145-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ some fine sand
GSD-146	587377.19	692191.13	GSD-146-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray well mixed silt / medium sand and gravel
GSD-147	587401.8	692485.34	GSD-147-0.0-0.5	5/5/2005	ML	10Y 4/2	Grayish olive silt
GSD-148	587380.39	692339.81	GSD-148-0.0-0.5	5/5/2005	SM	10Y 4/2	Dark Gray (oily) mixed coarse sand, fine gravel, and silt
GSD-149	587401	692266.29	GSD-149-0.0-0.5	5/5/2005	GP	5YR 4/1	Mixed color - cobbles, rock, coarse gravel and medium sand
GSD-150	587409.9	692425.72	GSD-150-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ fine sand
GSD-151	585337.21	693920.2	GSD-151-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ fine sand
GSD-152	585715.15	694024.09	GSD-152-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ fine sand
GSD-153	585529.45	693972.16	GSD-153-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive fine sand w/ silt
GSD-154	585449.21	693925.47	GSD-154-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ fine sand
GSD-155	585612.82	694001.72	GSD-155-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ small amount of fine sand
GSD-156	584574.53	696460.56	GSD-156-0.0-0.5	5/5/2005	SW	5Y 5/6	Light brown olive medium and fine sand w/ fine gravel
GSD-157	584911.97	696513.35	GSD-157-0.0-0.5	5/5/2005	ML	10Y 4/2	Dark gray olive silt w/ medium sand and gravel
GSD-158	584781.7	696459.23	GSD-158-0.0-0.5	5/5/2005	SP	5YR 4/1	Brownish gray medium sand and fine gravel w/ coarse gravel
GSD-159	584652.47	696437	GSD-159-0.0-0.5	5/5/2005	OH	5YR 4/1	Brownish gray medium and fine sand, some coarse sand, some organic matter
GSD-160	584848.44	696495.28	GSD-160-0.0-0.5	5/5/2005	SP	5YR 4/1	Brownish gray medium and fine sand, one cooble
GSD-161	598458.48	743084.64	GSD-161-0.0-0.5	5/6/2005	ML	5Y 5/6	Light olive brown clayey silt w/ coarse gravel pieces
GSD-162	598764.41	743197.9	GSD-162--0.0-0.5	5/6/2005	OH	5YR 4/1	Brownish gray fine sand w/ some organic matter
GSD-163	598600.89	743110.64	GSD-163--0.0-0.5	5/6/2005	SP	5YR 4/1	Brownish gray medium and coarse sand, w/ multi colored sands
GSD-164	598531.98	743100.17	GSD-164-0.0-0.5	5/6/2005	GP	5YR 4/1	Brownish gray coarse gravel up tp 1" w/ coarse and medium sand
GSD-165	598707.88	743141.78	GSD-165	5/6/2005			No sample - rocky
GSD-166	599477.37	740684.83	GSD-166-0.0-0.5	5/6/2005	ML	5YR 3/2	Grayish brown silt w/ fine sand to coarse gravel
GSD-167	599669.84	740738.91	GSD-167-0.0-0.5	5/6/2005	SW	5YR 4/1	Brownish gray fine sand

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GSD-168	599578.28	740713.27	GSD-168-0.0-0.5	5/6/2005			No sample - rock and cobbles
GSD-169	599521.09	740707.83	GSD-169-0.0-0.5	5/6/2005	GP	5R 4/6	Red rocks, cobbles, and coarse gravel
GSD-170	599626.15	740727.94	GSD-170-0.0-0.5	5/6/2005	GP	10R 4/6	Reddish brown rocks cobbles and fine sand
GSD-171	600641.6	739520.93	GSD-171-0.0-0.5	5/17/2005	GP	5R 4/1	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-172	600821.03	737347.09	GSD-172-0.0-0.5	5/17/2005	SM	5YR 3/2	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-173	598876.19	738331.32	GSD-173-0.0-0.5	5/17/2005	SP	5YR 4/1	Brownish gray medium and fine sand w/ fine gravel
GSD-174	598742.53	738362.91	GSD-174-0.0-0.5	5/17/2005	SM	5YR 3/2	Grayish brown medium fine sand w/ some black silt
GSD-175	597452	738113	GSD-175-0.0-0.5	5/17/2005			No sample - will not hold in core
GSD-176	597417.46	737689.17	GSD-176-0.0-0.5	5/17/2005	SW	5YR 3/2	Grayish brown fine sand - silt w/ organic
GSD-177	597150.82	736894.76	GSD-177-0.0-0.5	5/17/2005	ML	5YR 3/2	Grayish olive silt w/ fine sand
GSD-178	597287.15	736925.45	GSD-178-0.0-0.5	5/17/2005	SP	5YR 4/1	Brownish gray medium and fine sand
GSD-179	597241.59	734938.25	GSD-179-0.0-0.5	5/17/2005	SP	10Y 4/2	Grayish olive fine sandy w/ coarse gravel some organic
GSD-180	597460.01	734886.17	GSD-180-0.0-0.5	5/17/2005	SP	10Y 4/2	Grayish olive fine sandy w/ fine gravel some organic
GSD-181	597421.99	734903.29	GSD-181-0.0-0.5	5/17/2005	SC	10Y 4/2	Grayish olive medium sandy w/ fine sand some clay and medium gravel
GSD-182	597355	734900	GSD-182-0.0-0.5	5/17/2005	SW	10Y 4/2	Grayish olive fine sandy w/silt
GSD-183	597277.81	734916.57	GSD-183-0.0-0.5	5/17/2005	SW	10Y 4/2	Grayish olive fine and medium sand w/ silt
GSD-184	597246	734493	GSD-184-0.0-0.5	5/17/2005	SW	10Y 4/2	Grayish olive fine sandy w/silt
GSD-185	597246	734505	GSD-185-0.0-0.5	5/17/2005	SW	10Y 4/2	Grayish olive fine sandy w/silt
GSD-186	597025.14	733572.29	GSD-186-0.0-0.5	5/17/2005	SM	5YR 4/1	Brownish gray well mixed fine sand silt gravel cobble
GSD-187	596251.13	730060.18	GSD-187-0.0-0.5	5/17/2005	ML	10YR 5/4	Moderate yellowish brown coarse gravel w/ red clay and medium sand
GSD-188	596354.28	730111.99	GSD-188-0.0-0.5	5/17/2005	ML	10Y 4/2	Grayish olive silt w/ fine sand and organic
GSD-189	596985.03	728124.69	GSD-189-0.0-0.5	5/17/2005	SP	5YR 4/1	Brownish gray medium to carse sand with fine gravel
GSD-190	597042.48	727858.63	GSD-190-0.0-0.5	5/17/2005	SM	5YR 3/2	Grayish brown medium sandy silt w/ fine and medium gravel
GSD-191	596038.03	724744.92	GSD-191-0.0-0.5	5/17/2005	SM	5YR 3/2	Grayish brown silty fine sand
GSD-192	596118.11	724616.7	GSD-192-0.0-0.5	5/17/2005	SC	5Y 5/6	Light olive brown coarse sand, medium and fine gravel w/ tan clay
GSD-193	594667.87	723764.4	GSD-193-0.0-0.5	5/17/2005	SW	5YR 3/2	Grayish brown medium sand w/ silt organic mater
GSD-194	594583.5	723876.55	GSD-194-0.0-0.5	5/17/2005	ML	10Y 4/2	Grayish olive silt w/ coarse and fine sand, organics
GSD-195	594420.02	723826.14	GSD-195-0.0-0.5	5/17/2005	SP	5YR 4/1	Brownish gray fine/medium sand w/ medium to coarse gravel
GSD-196	594437.93	723688.9	GSD-196-0.0-0.5	5/17/2005	SP	5YR 3/2	Grayish brown medium sand w/fine to medium gravel and silt
GSD-197	592371.54	722025.84	GSD-197-0.0-0.5	5/17/2005	OL	5YR 4/1	Brownish gray fine sand w/ some organic matter
GSD-198	591951.06	718981.85	GSD-198-0.0-0.5	5/17/2005	SP	5YR 4/1	Brownish gray medium to coarse sand and fine gravel w/ organic matter
GSD-199	592113.38	718952.94	GSD-199-0.0-0.5	5/17/2005	ML	10Y 4/2	Grayish olive silt
GSD-200	592086.92	717339.33	GSD-200-0.0-0.5	5/18/2005	ML	10Y 4/2	Grayish olive fine silt - fine sand
GSD-201	592042.52	717266.54	GSD-201-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown sand w/ slight silt, some gravel, some organics, some rocks
GSD-202	591975.8	715407.15	GSD-202-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt
GSD-203	591693.54	714883.41	GSD-203-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silty sand w/ gravel and rocks
GSD-204	591539.99	714848.84	GSD-204-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown fine silt, sand, slight organic
GSD-205	589648.66	709097.86	GSD-205-0.0-0.5	5/18/2005	SW	5YR 4/1	Brownish gray fine sand, slight gravel, organic material and rocks up to 2"
GSD-206	589484.65	709245.08	GSD-206-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown fine to coarse sand, fine to coarse gravel, rocks up to 1"
GSD-207	589573.53	709318.69	GSD-207-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown coarse sand, trace gravel, trace organics
GSD-208	587166.36	704793.56	GSD-208-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown fine sand, slight silt, trace organics
GSD-209	587103.68	704819.39	GSD-209-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt, slight organics

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GSD-210	587059.07	704649.34	GSD-210-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown fine sand - silt, trace organics
GSD-211	586338.02	703052.57	GSD-211-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown top 2" fine sand, bottom silt
GSD-212	586238.23	702994.49	GSD-212-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt, trace gravel
GSD-213	585028.14	700403.27	GSD-213-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown fine sand - silt, slight rocks and gravel
GSD-214	584703.98	698499.43	GSD-214-0.0-0.5	5/18/2005	GW	5YR 3/2	Grayish brown mostly rocks and gravel, recovered slight silt
GSD-215	584809.66	698379.68	GSD-215-0.0-0.5	5/18/2005	SP	5YR 3/2	Grayish brown sand w/ slight silt, trace organics
GSD-216	584785.34	698178.36	GSD-216-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ lots of organic material (leaves and twigs)
GSD-217	585360.27	695073.02	GSD-217-0.0-0.5	5/18/2005	GP	5YR 3/2	Grayish brown gravel and rocks up to 1", slight silt recovered
GSD-218	586148	692935	GSD-218-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ slight rocks
GSD-219	586095.99	692892.4	GSD-219-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ slight gravel and rocks
GSD-220	585928.4	693005.15	GSD-220-0.0-0.5	5/18/2005	SM	5YR 3/2	Grayish brown sandy silt trace grave, slight organics
GSD-221	586006.02	693063.99	GSD-221-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt
GSD-222	586081.2	693130.15	GSD-222-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ slight organics
GSD-223	590475.03	692992.31	GSD-223-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ organics
GSD-224	590576.34	692860.41	GSD-224-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ coarse rocks up to 0.5"
GSD-225	590799.89	693268.68	GSD-225-0.0-0.5	5/18/2005	GP	5YR 3/2	Grayish brown, mostly rocks, gravel to 1" and shell fragments, slight silt and coarse sand
GSD-226	590638.78	693299.58	GSD-226-0.0-0.5	5/18/2005	SW	5YR 3/2	Grayish brown fine sand w/ trace silt and organics
GSD-227	592772.4	695435.02	GSD-227-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt
GSD-228	593226.64	695434.11	GSD-228-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt
GSD-229	597708.5	694949.68	GSD-229-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown fine sand, slight silt, organic material
GSD-230	597602.31	694826.23	GSD-230-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ organic material
GSD-231	598285.84	692791.38	GSD-231-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ organic material
GSD-232	597367.49	689732.39	GSD-232-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ slight organics
GSD-233	597658.21	689448.6	GSD-233-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt w/ slight organics
GSD-234	597494.17	689384.54	GSD-234-0.0-0.5	5/18/2005	OL	5YR 3/2	Grayish brown, mostly twigs, leafy matter, organic material, trace silt
GSD-235	596810.69	687382.02	GSD-235-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt
GSD-236	596952.87	687308.57	GSD-236-0.0-0.5	5/18/2005	ML	5YR 3/2	Grayish brown silt, slight organics
GSD-237	589513.68	709082.6	GSD-237	5/20/2005			No sample - Rock pile too large to collect
GSD-238	599493.8	736783.27	GSD-238-0.0-0.5	5/20/2005	GP	10Y 4/2	Fine and coarse gravel and rubble, some coarse sand some olive gray clay
GSD-239	597794.93	738363.92	GSD-239-0.0-0.5	5/20/2005	SP		Multi colored coarse and medium sand and fine gravel
GSD-240	597569.87	738243.27	GSD-240-0.0-0.5	5/20/2005	SC	5Y 5/6	Light olive brown to moderate yellow brown fine sandy clay (10YR 5/4)
GSD-241	597221.15	734651.3	GSD-241-0.0-0.5	5/20/2005	SP	5Y 5/6	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-242	597201.4	734268.47	GSD-242-0.0-0.5	5/20/2005	SW	5YR 4/1	Brownish gray fine sand
GSD-243	597257.71	734370.59	GSD-243-0.0-0.5	5/20/2005	SW	5YR 4/1	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-244	596578.68	732001.87	GSD-244-0.0-0.5	5/20/2005	SP	5YR 4/1	Light brownish gray fine/medium sand silt organic
GSD-245	596963.83	727518.51	GSD-245-0.0-0.5	5/20/2005	SW	5YR 4/1	Brownish gray fine sand
GSD-246	594652.7	723819.23	GSD-246-0.0-0.5	5/20/2005	SP	5YR 4/1	Brownish gray medium and coarse sand, slight organic matter
GSD-247	593311.72	723417.77	GSD-247-0.0-0.5	5/20/2005	SP	5YR 4/1	Brownish gray medium and coarse sand, organic matter
GSD-248	592215.06	721623.68	GSD-248-0.0-0.5	5/20/2005	SP		Mixed color coarse gravel to medium sand, some cobbles, some fine sand
GSD-249	592054.07	719510.36	GSD-249-0.0-0.5	5/20/2005	ML	5YR 4/1	Brownish gray silt w/ organic

Location	Easting	Northing	Sample ID	Date	USCS Symbol	Color Designation	Description
GSD-250	591865.17	717693.26	GSD-250-0.0-0.5	5/20/2005	GP		Mixed color cobble and coarse gravel to coarse sand, some silt
GSD-251	591598.79	714836.16	GSD-251-0.0-0.5	5/20/2005	ML	5YR 4/1	Light brownish gray silt w/ some fine sand, organic
GSD-252	591647.48	714903.46	GSD-252-0.0-0.5	5/20/2005	SP	5YR 4/1	Brownish gray fine and medium sand, organic
GSD-253	589553.92	709555.69	GSD-253-0.0-0.5	5/20/2005	SP	5YR 4/1	Light brownish gray medium to coarse sand, some fine sand
GSD-254	588595.96	707722.32	GSD-254-0.0-0.5	5/20/2005	ML	5YR 3/2	Grayish brown silt
GSD-255	588608.59	707309.85	GSD-255-0.0-0.5	5/20/2005	ML	10Y 4/2	Grayish olive silt
GSD-256	596937.95	685871.93	GSD-256-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive silt, slight organic
GSD-257	596832.28	685853.76	GSD-257-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive silt, w/ a lot of organic
GSD-258	596695.92	685812.23	GSD-258-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive
GSD-259	597578.78	682327.65	GSD-259-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive
GSD-260	597570.82	682378.69	GSD-260-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive
GSD-261	597847.45	682349.64	GSD-261-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive
GSD-262	597692.36	682716.43	GSD-262-0.0-0.5	5/20/2005	CL	10YR 5/4	Moderate yellowish brown dense clay
GSD-263	598028.94	691444.24	GSD-263-0.0-0.5	5/20/2005	OL	5YR 3/2	Dark grayish brown 100% organic
GSD-264	598102.73	691729.98	GSD-264-0.0-0.5	5/20/2005	ML	5YR 3/2	Dark grayish brown silt w/ 50% organics
GSD-265	594812.01	695582.7	GSD-265-0.0-0.5	5/20/2005	ML	5YR 3/2	Dark grayish brown silt w/ 50% organics
GSD-266	592167.13	695170.09	GSD-266-0.0-0.5	5/20/2005	ML	5YR 3/2	Dark grayish brown silt
GSD-267	586802.93	692495.66	GSD-267-0.0-0.5	5/20/2005	OL	10R 3/4	Dark brown 100% organic
GSD-268	586466.24	692657.12	GSD-268-0.0-0.5	5/20/2005	OH	10Y 4/2	Dark gray olive organic matter with coarse gravel
GSD-269	585342.72	694587.52	GSD-269-0.0-0.5	5/20/2005	OL	10Y 4/2	Dark grayish olive fine sand w/ organic
GSD-270	585033.4	695092.82	GSD-270-0.0-0.5	5/20/2005	ML	10Y 4/2	Dark grayish olive silt
GSD-271	584652.41	697349.53	GSD-271-0.0-0.5	5/20/2005	SP	5YR 4/1	Dark brownish gray fine and medium sand and cobbles and fine gravel
GSD-272	584673.2	697969.35	GSD-272-0.0-0.5	5/20/2005	SP	10Y 4/2	Dark grayish olive fine sandy to fine gravel mix
GSD-273	585504.04	701938.51	GSD-273-0.0-0.5	5/20/2005	ML	5YR 3/2	Dark grayish brown silt w/ organic
GSD-274	586695.21	703567.18	GSD-274-0.0-0.5	5/20/2005	ML	5YR 3/2	Dark grayish brown silt w/ surface coarse sand / fine gravel
GSD-275	586891.41	703873.24	GSD-275-0.0-0.5	5/20/2005	ML	5YR 3/2	Dark grayish brown silt w/some coarse medium sand

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-004	AG01113	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% VERY COURSE SAND >1 - 2 MM	2.1	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% COARSE SAND >.5 - 1 MM	9.5	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% MEDIUM SAND >.25 - .5 MM	41	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% FINE SAND >.125 - .25 MM	40	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% VERY FINE SAND >.0625 - .125 MM	3.8	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% SILT	2.1	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	% CLAY & COLLOIDS	1.3	%	ASTM D422-63	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-004	AG01113	ORGANIC CARBON, TOT.	8100	mg/Kg	C-88 @60C	20050377	708471.74	589201.04	Grayish brown medium to fine sand, some silt / leaves
GSD-005	AG01114	% GRANULE & LARGER >2 MM	74	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% VERY COURSE SAND >1 - 2 MM	13	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% COARSE SAND >.5 - 1 MM	5.9	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% MEDIUM SAND >.25 - .5 MM	4.8	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% FINE SAND >.125 - .25 MM	0.8	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% VERY FINE SAND >.0625 - .125 MM	0.9	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% SILT	0.3	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-005	AG01114	ORGANIC CARBON, TOT.	3200	mg/Kg	C-88 @60C	20050378	708381.37	589306.57	Brownish gray coarse gravel to coarse sand
GSD-007	AG01115	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% VERY COURSE SAND >1 - 2 MM	1.1	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% COARSE SAND >.5 - 1 MM	1.4	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% MEDIUM SAND >.25 - .5 MM	1.7	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% FINE SAND >.125 - .25 MM	12	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% VERY FINE SAND >.0625 - .125 MM	8.6	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% SILT	70	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	% CLAY & COLLOIDS	4.9	%	ASTM D422-63	20050379	710976.14	589631.04	Dark gray olive silt
GSD-007	AG01115	ORGANIC CARBON, TOT.	67000	mg/Kg	C-88 @60C	20050379	710976.14	589631.04	Dark gray olive silt
GSD-008	AG01116	% GRANULE & LARGER >2 MM	3.3	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	% VERY COURSE SAND >1 - 2 MM	5.6	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	% COARSE SAND >.5 - 1 MM	23	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	% MEDIUM SAND >.25 - .5 MM	48	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	% FINE SAND >.125 - .25 MM	18	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-008	AG01116	% VERY FINE SAND >.0625 - .125 MM	1.2	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	% SILT	0.8	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	% CLAY & COLLOIDS	0.1	%	ASTM D422-63	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-008	AG01116	ORGANIC CARBON, TOT.	3600	mg/Kg	C-88 @60C	20050380	710990.62	589502.14	Brownish gray medium to coarse sand
GSD-011	AG01117	% GRANULE & LARGER >2 MM	22	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% VERY COURSE SAND >1 - 2 MM	7.3	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% COARSE SAND >.5 - 1 MM	9.5	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% MEDIUM SAND >.25 - .5 MM	17	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% FINE SAND >.125 - .25 MM	17	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% VERY FINE SAND >.0625 - .125 MM	7.9	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% SILT	18	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	% CLAY & COLLOIDS	1.6	%	ASTM D422-63	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-011	AG01117	ORGANIC CARBON, TOT.	37000	mg/Kg	C-88 @60C	20050381	713406.31	590542.34	Grayish olive silt w/ coarse sand and large gravel
GSD-014	AG01118	% GRANULE & LARGER >2 MM	15	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% VERY COURSE SAND >1 - 2 MM	9.2	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% COARSE SAND >.5 - 1 MM	9.2	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% MEDIUM SAND >.25 - .5 MM	12	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% FINE SAND >.125 - .25 MM	35	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% VERY FINE SAND >.0625 - .125 MM	13	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% SILT	5.3	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	% CLAY & COLLOIDS	2.6	%	ASTM D422-63	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-014	AG01118	ORGANIC CARBON, TOT.	12000	mg/Kg	C-88 @60C	20050382	713307.34	590727.36	Brownish gray fine and medium sand, some silt
GSD-018	AG01119	% GRANULE & LARGER >2 MM	37	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% VERY COURSE SAND >1 - 2 MM	5.1	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% COARSE SAND >.5 - 1 MM	7.4	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% MEDIUM SAND >.25 - .5 MM	15	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% FINE SAND >.125 - .25 MM	8.3	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% VERY FINE SAND >.0625 - .125 MM	5.1	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% SILT	22	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	% CLAY & COLLOIDS	1.1	%	ASTM D422-63	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-018	AG01119	ORGANIC CARBON, TOT.	15000	mg/Kg	C-88 @60C	20050397	715581.94	592062.07	Grayish brown silt w/ some fine gravel
GSD-019	AG01120	% GRANULE & LARGER >2 MM	5.5	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	% VERY COURSE SAND >1 - 2 MM	3.8	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-019	AG01120	% COARSE SAND >.5 - 1 MM	12	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	% MEDIUM SAND >.25 - .5 MM	30	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	% FINE SAND >.125 - .25 MM	42	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	% VERY FINE SAND >.0625 - .125 MM	3.2	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	% SILT	2	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	% CLAY & COLLOIDS	1.3	%	ASTM D422-63	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-019	AG01120	ORGANIC CARBON, TOT.	8900	mg/Kg	C-88 @60C	20050398	715615.44	592015.33	Grayish brown medium coarse gravel and silt
GSD-022	AG01121	% GRANULE & LARGER >2 MM	9.2	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% VERY COURSE SAND >1 - 2 MM	7.5	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% COARSE SAND >.5 - 1 MM	15	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% MEDIUM SAND >.25 - .5 MM	22	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% FINE SAND >.125 - .25 MM	17	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% VERY FINE SAND >.0625 - .125 MM	12	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% SILT	17	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	% CLAY & COLLOIDS	0.7	%	ASTM D422-63	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-022	AG01121	ORGANIC CARBON, TOT.	15000	mg/Kg	C-88 @60C	20050399	718124.55	592012.39	Grayish brown silt w/ little to some fine sand
GSD-023	AG01122	% GRANULE & LARGER >2 MM	0.5	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% VERY COURSE SAND >1 - 2 MM	3.2	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% COARSE SAND >.5 - 1 MM	8.1	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% MEDIUM SAND >.25 - .5 MM	19	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% FINE SAND >.125 - .25 MM	26	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% VERY FINE SAND >.0625 - .125 MM	8.6	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% SILT	32	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-023	AG01122	% CLAY & COLLOIDS	2.7	%	ASTM D422-63	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-023	AG01122	ORGANIC CARBON, TOT.	55000	mg/Kg	C-88 @60C	20050400	718090.31	591876.8	Grayish brown silt w/ little to some fine sand and some fine gravel
GSD-027	AG01123	% GRANULE & LARGER >2 MM	8.8	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% VERY COURSE SAND >1 - 2 MM	2.3	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% COARSE SAND >.5 - 1 MM	2.3	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% MEDIUM SAND >.25 - .5 MM	3.1	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% FINE SAND >.125 - .25 MM	12	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% VERY FINE SAND >.0625 - .125 MM	14	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% SILT	56	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	% CLAY & COLLOIDS	2.1	%	ASTM D422-63	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-027	AG01123	ORGANIC CARBON, TOT.	55000	mg/Kg	C-88 @60C	20050401	720687.08	592323.95	Grayish brown silt w/ slight organic / trace gravel
GSD-028	AG01124	% GRANULE & LARGER >2 MM	12	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% VERY COURSE SAND >1 - 2 MM	6.9	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% COARSE SAND >.5 - 1 MM	9.8	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% MEDIUM SAND >.25 - .5 MM	44	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% FINE SAND >.125 - .25 MM	16	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% VERY FINE SAND >.0625 - .125 MM	2	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% SILT	9.1	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	% CLAY & COLLOIDS	0.7	%	ASTM D422-63	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-028	AG01124	ORGANIC CARBON, TOT.	8400	mg/Kg	C-88 @60C	20050402	720730.62	592214.58	Grayish brown top 6" fine silt, sand and gravel, 6"-12" silt
GSD-030	AG01125	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% VERY COURSE SAND >1 - 2 MM	0.4	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% COARSE SAND >.5 - 1 MM	1.2	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% MEDIUM SAND >.25 - .5 MM	3.3	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% FINE SAND >.125 - .25 MM	78	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% VERY FINE SAND >.0625 - .125 MM	12	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% SILT	3.4	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	% CLAY & COLLOIDS	2.3	%	ASTM D422-63	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-030	AG01125	ORGANIC CARBON, TOT.	17000	mg/Kg	C-88 @60C	20050403	720724.53	592277.76	Grayish brown fine sand - silt
GSD-031	AG01126	% GRANULE & LARGER >2 MM	35	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	% VERY COURSE SAND >1 - 2 MM	6.2	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	% COARSE SAND >.5 - 1 MM	8.4	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	% MEDIUM SAND >.25 - .5 MM	14	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-031	AG01126	% FINE SAND >.125 - .25 MM	17	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	% VERY FINE SAND >.0625 - .125 MM	9.4	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	% SILT	9.9	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-031	AG01126	ORGANIC CARBON, TOT.	9700	mg/Kg	C-88 @60C	20050404	723329.39	592787.6	Grayish brown medium to fine silt-sand, some gravel to 1"
GSD-033	AG01127	% GRANULE & LARGER >2 MM	2.9	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% VERY COURSE SAND >1 - 2 MM	5.4	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% COARSE SAND >.5 - 1 MM	19	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% MEDIUM SAND >.25 - .5 MM	55	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% FINE SAND >.125 - .25 MM	13	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% VERY FINE SAND >.0625 - .125 MM	1.8	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% SILT	0	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	% CLAY & COLLOIDS	3	%	ASTM D422-63	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-033	AG01127	ORGANIC CARBON, TOT.	5100	mg/Kg	C-88 @60C	20050405	723180.16	592857.78	Grayish brown fine to medium sand
GSD-036	AG01128	% GRANULE & LARGER >2 MM	4.2	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% VERY COURSE SAND >1 - 2 MM	1.3	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% COARSE SAND >.5 - 1 MM	3.3	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% MEDIUM SAND >.25 - .5 MM	17	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% FINE SAND >.125 - .25 MM	35	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% VERY FINE SAND >.0625 - .125 MM	12	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% SILT	25	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	% CLAY & COLLOIDS	2	%	ASTM D422-63	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-036	AG01128	ORGANIC CARBON, TOT.	33000	mg/Kg	C-88 @60C	20050406	724276.83	595495.31	Grayish brown silt w/ some fine sand / slight gravel to 0.5"
GSD-038	AG01129	% GRANULE & LARGER >2 MM	52	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% VERY COURSE SAND >1 - 2 MM	17	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% COARSE SAND >.5 - 1 MM	12	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% MEDIUM SAND >.25 - .5 MM	12	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% FINE SAND >.125 - .25 MM	4.3	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% VERY FINE SAND >.0625 - .125 MM	1.1	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% SILT	1.1	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-038	AG01129	ORGANIC CARBON, TOT.	5000	mg/Kg	C-88 @60C	20050407	724155.53	595587.72	Grayish brown fine to medium sand, little fine sand
GSD-039	AG01130	% GRANULE & LARGER >2 MM	3.4	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-039	AG01130	% VERY COURSE SAND >1 - 2 MM	6.3	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	% COARSE SAND >.5 - 1 MM	24	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	% MEDIUM SAND >.25 - .5 MM	26	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	% FINE SAND >.125 - .25 MM	24	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	% VERY FINE SAND >.0625 - .125 MM	7.4	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	% SILT	8.6	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	% CLAY & COLLOIDS	0.9	%	ASTM D422-63	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-039	AG01130	ORGANIC CARBON, TOT.	15000	mg/Kg	C-88 @60C	20050408	724217.47	595559.13	Grayish brown medium sand - silt
GSD-041	AG01131	% GRANULE & LARGER >2 MM	16	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% VERY COURSE SAND >1 - 2 MM	12	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% COARSE SAND >.5 - 1 MM	11	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% MEDIUM SAND >.25 - .5 MM	9.2	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% FINE SAND >.125 - .25 MM	31	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% VERY FINE SAND >.0625 - .125 MM	13	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% SILT	8.4	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	% CLAY & COLLOIDS	1.1	%	ASTM D422-63	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-041	AG01131	ORGANIC CARBON, TOT.	20000	mg/Kg	C-88 @60C	20050409	726215.4	596583.13	Grayish brown silt fine to medium sand, trace gravel
GSD-044	AG01132	% GRANULE & LARGER >2 MM	8.1	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% VERY COURSE SAND >1 - 2 MM	8.1	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% COARSE SAND >.5 - 1 MM	25	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% MEDIUM SAND >.25 - .5 MM	36	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% FINE SAND >.125 - .25 MM	9.8	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% VERY FINE SAND >.0625 - .125 MM	1.7	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% SILT	12	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-044	AG01132	ORGANIC CARBON, TOT.	8500	mg/Kg	C-88 @60C	20050410	726202.27	596627.67	Grayish brown, top 3" fine medium sand, 3" clayey silt
GSD-047	AG01133	% GRANULE & LARGER >2 MM	29	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	% VERY COURSE SAND >1 - 2 MM	2.2	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	% COARSE SAND >.5 - 1 MM	2.3	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	% MEDIUM SAND >.25 - .5 MM	3.1	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	% FINE SAND >.125 - .25 MM	24	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	% VERY FINE SAND >.0625 - .125 MM	21	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	% SILT	16	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-047	AG01133	% CLAY & COLLOIDS	2.1	%	ASTM D422-63	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-047	AG01133	ORGANIC CARBON, TOT.	48000	mg/Kg	C-88 @60C	20050411	728809.59	596956.9	Grayish brown silt w/ fine sand and gravel
GSD-048	AG01134	% GRANULE & LARGER >2 MM	12	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% VERY COURSE SAND >1 - 2 MM	12	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% COARSE SAND >.5 - 1 MM	36	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% MEDIUM SAND >.25 - .5 MM	25	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% FINE SAND >.125 - .25 MM	10	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% VERY FINE SAND >.0625 - .125 MM	1.8	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% SILT	2.2	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	% CLAY & COLLOIDS	0.7	%	ASTM D422-63	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-048	AG01134	ORGANIC CARBON, TOT.	4600	mg/Kg	C-88 @60C	20050412	728751.77	596872.39	Grayish brown coarse sand and gravel, some trace silt
GSD-052	AG01135	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% VERY COURSE SAND >1 - 2 MM	6.2	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% COARSE SAND >.5 - 1 MM	6.4	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% MEDIUM SAND >.25 - .5 MM	6	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% FINE SAND >.125 - .25 MM	9.4	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% VERY FINE SAND >.0625 - .125 MM	12	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% SILT	59	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	% CLAY & COLLOIDS	1.4	%	ASTM D422-63	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-052	AG01135	ORGANIC CARBON, TOT.	78000	mg/Kg	C-88 @60C	20050413	706255.81	587798.56	Grayish brown silt w/ trace fine sand
GSD-053	AG01136	% GRANULE & LARGER >2 MM	3.3	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% VERY COURSE SAND >1 - 2 MM	5.7	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% COARSE SAND >.5 - 1 MM	14	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% MEDIUM SAND >.25 - .5 MM	41	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% FINE SAND >.125 - .25 MM	25	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% VERY FINE SAND >.0625 - .125 MM	5.3	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% SILT	2	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	% CLAY & COLLOIDS	3.1	%	ASTM D422-63	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-053	AG01136	ORGANIC CARBON, TOT.	10000	mg/Kg	C-88 @60C	20050414	706363.36	587636.64	Grayish brown fine to medium sand, some silt
GSD-057	AG01137	% GRANULE & LARGER >2 MM	55	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	% VERY COURSE SAND >1 - 2 MM	11	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	% COARSE SAND >.5 - 1 MM	11	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	% MEDIUM SAND >.25 - .5 MM	13	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-057	AG01137	% FINE SAND >.125 - .25 MM	5.3	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	% VERY FINE SAND >.0625 - .125 MM	1.9	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	% SILT	2.9	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	% CLAY & COLLOIDS	0.9	%	ASTM D422-63	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-057	AG01137	ORGANIC CARBON, TOT.	10000	mg/Kg	C-88 @60C	20050415	703819.71	586883.88	Grayish brown fine - coarse sand, gravel, little to some silt
GSD-058	AG01138	% GRANULE & LARGER >2 MM	1.2	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% VERY COURSE SAND >1 - 2 MM	2.2	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% COARSE SAND >.5 - 1 MM	4.8	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% MEDIUM SAND >.25 - .5 MM	33	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% FINE SAND >.125 - .25 MM	44	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% VERY FINE SAND >.0625 - .125 MM	7.6	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% SILT	5.6	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	% CLAY & COLLOIDS	1.2	%	ASTM D422-63	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-058	AG01138	ORGANIC CARBON, TOT.	14000	mg/Kg	C-88 @60C	20050416	703889.7	586745.11	Grayish brown fine - coarse sand, some silt
GSD-162	AG01139	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% VERY COURSE SAND >1 - 2 MM	1.5	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% COARSE SAND >.5 - 1 MM	2.5	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% MEDIUM SAND >.25 - .5 MM	9.4	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% FINE SAND >.125 - .25 MM	56	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% VERY FINE SAND >.0625 - .125 MM	21	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% SILT	7.1	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	% CLAY & COLLOIDS	2.1	%	ASTM D422-63	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-162	AG01139	ORGANIC CARBON, TOT.	21000	mg/Kg	C-88 @60C	AAD1	743197.9	598764.41	Brownish gray fine sand w/ some organic matter
GSD-163	AG01140	% GRANULE & LARGER >2 MM	31	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	% VERY COURSE SAND >1 - 2 MM	23	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	% COARSE SAND >.5 - 1 MM	27	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	% MEDIUM SAND >.25 - .5 MM	12	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	% FINE SAND >.125 - .25 MM	6	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-163	AG01140	% VERY FINE SAND >.0625 - .125 MM	0.4	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	% SILT	0.7	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	% CLAY & COLLOIDS	0	%	ASTM D422-63	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-163	AG01140	ORGANIC CARBON, TOT.	15000	mg/Kg	C-88 @60C	AAD2	743110.64	598600.89	Brownish gray medium and coarse sand, w/ multi-colored sands
GSD-166	AG01141	% GRANULE & LARGER >2 MM	39	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% VERY COURSE SAND >1 - 2 MM	5.6	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% COARSE SAND >.5 - 1 MM	6.5	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% MEDIUM SAND >.25 - .5 MM	11	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% FINE SAND >.125 - .25 MM	19	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% VERY FINE SAND >.0625 - .125 MM	8	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% SILT	9.7	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	% CLAY & COLLOIDS	0.7	%	ASTM D422-63	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-166	AG01141	ORGANIC CARBON, TOT.	62000	mg/Kg	C-88 @60C	AAD3	740684.83	599477.37	Grayish brown silt w/ fine sand to coarse gravel
GSD-167	AG01142	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% VERY COURSE SAND >1 - 2 MM	1	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% COARSE SAND >.5 - 1 MM	1.5	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% MEDIUM SAND >.25 - .5 MM	5.1	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% FINE SAND >.125 - .25 MM	73	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% VERY FINE SAND >.0625 - .125 MM	15	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% SILT	3.1	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	% CLAY & COLLOIDS	1.5	%	ASTM D422-63	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-167	AG01142	ORGANIC CARBON, TOT.	14000	mg/Kg	C-88 @60C	AAD4	740738.91	599669.84	Brownish gray fine sand
GSD-061	AG01143	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	% VERY COURSE SAND >1 - 2 MM	4.9	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	% COARSE SAND >.5 - 1 MM	5.5	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	% MEDIUM SAND >.25 - .5 MM	4.5	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	% FINE SAND >.125 - .25 MM	12	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	% VERY FINE SAND >.0625 - .125 MM	10	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	% SILT	62	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-061	AG01143	% CLAY & COLLOIDS	1.3	%	ASTM D422-63	20050425	731241.1	596121.47	Grayish brown silt
GSD-061	AG01143	ORGANIC CARBON, TOT.	61000	mg/Kg	C-88 @60C	20050425	731241.1	596121.47	Grayish brown silt
GSD-062	AG01144	% GRANULE & LARGER >2 MM	12	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% VERY COURSE SAND >1 - 2 MM	4.5	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% COARSE SAND >.5 - 1 MM	12	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% MEDIUM SAND >.25 - .5 MM	29	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% FINE SAND >.125 - .25 MM	25	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% VERY FINE SAND >.0625 - .125 MM	9.2	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% SILT	6.6	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	% CLAY & COLLOIDS	2.3	%	ASTM D422-63	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-062	AG01144	ORGANIC CARBON, TOT.	2100	mg/Kg	C-88 @60C	20050426	731164.74	596337.32	Moderate yellowish brown coarse sand and trace gravel
GSD-063	AG01145	% GRANULE & LARGER >2 MM	21	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% VERY COURSE SAND >1 - 2 MM	3.8	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% COARSE SAND >.5 - 1 MM	11	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% MEDIUM SAND >.25 - .5 MM	17	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% FINE SAND >.125 - .25 MM	39	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% VERY FINE SAND >.0625 - .125 MM	6	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% SILT	1.4	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	% CLAY & COLLOIDS	1.8	%	ASTM D422-63	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-063	AG01145	ORGANIC CARBON, TOT.	12000	mg/Kg	C-88 @60C	20050427	731210.56	596233.56	Grayish brown fine silt, fine sand, organic matter
GSD-067	AG01146	% GRANULE & LARGER >2 MM	17	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% VERY COURSE SAND >1 - 2 MM	11	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% COARSE SAND >.5 - 1 MM	26	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% MEDIUM SAND >.25 - .5 MM	27	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% FINE SAND >.125 - .25 MM	8.4	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% VERY FINE SAND >.0625 - .125 MM	1.1	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% SILT	8.1	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	% CLAY & COLLOIDS	2.1	%	ASTM D422-63	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-067	AG01146	ORGANIC CARBON, TOT.	16000	mg/Kg	C-88 @60C	20050428	733696.99	597037.92	Grayish brown coarse sand - silt, trace gravel
GSD-068	AG01147	% GRANULE & LARGER >2 MM	1.6	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	% VERY COURSE SAND >1 - 2 MM	2.9	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	% COARSE SAND >.5 - 1 MM	3.8	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	% MEDIUM SAND >.25 - .5 MM	15	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-068	AG01147	% FINE SAND >.125 - .25 MM	57	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	% VERY FINE SAND >.0625 - .125 MM	7.7	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	% SILT	8.1	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	% CLAY & COLLOIDS	4	%	ASTM D422-63	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-068	AG01147	ORGANIC CARBON, TOT.	25000	mg/Kg	C-88 @60C	20050429	733725.65	596941.04	Grayish brown fine sand, some organic material
GSD-069	AG01148	% GRANULE & LARGER >2 MM	0.2	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% VERY COURSE SAND >1 - 2 MM	1.5	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% COARSE SAND >.5 - 1 MM	3	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% MEDIUM SAND >.25 - .5 MM	8.9	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% FINE SAND >.125 - .25 MM	35	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% VERY FINE SAND >.0625 - .125 MM	16	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% SILT	32	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	% CLAY & COLLOIDS	2.4	%	ASTM D422-63	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-069	AG01148	ORGANIC CARBON, TOT.	35000	mg/Kg	C-88 @60C	20050430	733735.75	596892.77	Grayish brown fine sand, silt w/ trace light brown sand
GSD-072	AG01149	% GRANULE & LARGER >2 MM	45	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% VERY COURSE SAND >1 - 2 MM	5.6	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% COARSE SAND >.5 - 1 MM	6	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% MEDIUM SAND >.25 - .5 MM	8.5	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% FINE SAND >.125 - .25 MM	12	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% VERY FINE SAND >.0625 - .125 MM	5.9	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% SILT	15	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	% CLAY & COLLOIDS	1.3	%	ASTM D422-63	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"
GSD-072	AG01149	ORGANIC CARBON, TOT.	28000	mg/Kg	C-88 @60C	20050431	736272.93	597442.96	Moderate yellowish brown, Grayish brown silty sand, coarse gravel up to 1"

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-073	AG01150	% GRANULE & LARGER >2 MM	1.5	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% VERY COURSE SAND >1 - 2 MM	3.7	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% COARSE SAND >.5 - 1 MM	41	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% MEDIUM SAND >.25 - .5 MM	38	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% FINE SAND >.125 - .25 MM	10	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% VERY FINE SAND >.0625 - .125 MM	2.1	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% SILT	3	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-073	AG01150	ORGANIC CARBON, TOT.	3600	mg/Kg	C-88 @60C	20050432	736189.6	597399.61	Grayish brown fine to coarse sand, trace gravel, trace shell fragments
GSD-076	AG01151	% GRANULE & LARGER >2 MM	34	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% VERY COURSE SAND >1 - 2 MM	4.5	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% COARSE SAND >.5 - 1 MM	4.6	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% MEDIUM SAND >.25 - .5 MM	11	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% FINE SAND >.125 - .25 MM	12	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% VERY FINE SAND >.0625 - .125 MM	9	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% SILT	23	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	% CLAY & COLLOIDS	1.8	%	ASTM D422-63	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-076	AG01151	ORGANIC CARBON, TOT.	46000	mg/Kg	C-88 @60C	20050433	738524.78	598175.27	Grayish brown silt w/ gravel up to 1"
GSD-077	AG01152	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	% VERY COURSE SAND >1 - 2 MM	2.3	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	% COARSE SAND >.5 - 1 MM	5.1	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	% MEDIUM SAND >.25 - .5 MM	54	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	% FINE SAND >.125 - .25 MM	29	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	% VERY FINE SAND >.0625 - .125 MM	4.6	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-077	AG01152	% SILT	2.4	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	% CLAY & COLLOIDS	2.2	%	ASTM D422-63	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-077	AG01152	ORGANIC CARBON, TOT.	9500	mg/Kg	C-88 @60C	20050434	738345.07	598184.9	Grayish brown fine sand - silt, organic material
GSD-078	AG01153	% GRANULE & LARGER >2 MM	2.4	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% VERY COURSE SAND >1 - 2 MM	8.3	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% COARSE SAND >.5 - 1 MM	39	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% MEDIUM SAND >.25 - .5 MM	44	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% FINE SAND >.125 - .25 MM	4.7	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% VERY FINE SAND >.0625 - .125 MM	0.5	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% SILT	1.1	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-078	AG01153	ORGANIC CARBON, TOT.	1700	mg/Kg	C-88 @60C	20050435	738417.91	598186.82	Grayish brown fine - coarse sand, trace organics
GSD-079	AG01154	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% VERY COURSE SAND >1 - 2 MM	0.2	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% COARSE SAND >.5 - 1 MM	0.2	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% MEDIUM SAND >.25 - .5 MM	0.2	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% FINE SAND >.125 - .25 MM	0.2	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% VERY FINE SAND >.0625 - .125 MM	0.9	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% SILT	61	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	% CLAY & COLLOIDS	37	%	ASTM D422-63	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-079	AG01154	ORGANIC CARBON, TOT.	1600	mg/Kg	C-88 @60C	20050436	738477.6	598185.38	Olive gray - grayish brown clayey material - medium stiff
GSD-081	AG01155	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% VERY COURSE SAND >1 - 2 MM	0.8	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% COARSE SAND >.5 - 1 MM	3.2	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% MEDIUM SAND >.25 - .5 MM	42	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% FINE SAND >.125 - .25 MM	46	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% VERY FINE SAND >.0625 - .125 MM	4.9	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% SILT	1.6	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	% CLAY & COLLOIDS	1.4	%	ASTM D422-63	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-081	AG01155	ORGANIC CARBON, TOT.	9500	mg/Kg	C-88 @60C	20050437	736782.57	599670.28	Grayish brown fine sand, trace organics
GSD-084	AG01156	% GRANULE & LARGER >2 MM	40	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	% VERY COURSE SAND >1 - 2 MM	26	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	% COARSE SAND >.5 - 1 MM	23	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-084	AG01156	% MEDIUM SAND >.25 - .5 MM	7.9	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	% FINE SAND >.125 - .25 MM	2.5	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	% VERY FINE SAND >.0625 - .125 MM	0.3	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	% SILT	0.7	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	% CLAY & COLLOIDS	0.1	%	ASTM D422-63	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-084	AG01156	ORGANIC CARBON, TOT.	3200	mg/Kg	C-88 @60C	20050438	736755.54	599658.59	Grayish brown coarse sand, gravel up to 1/2"
GSD-086	AG01157	% GRANULE & LARGER >2 MM	35	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% VERY COURSE SAND >1 - 2 MM	3.5	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% COARSE SAND >.5 - 1 MM	3.6	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% MEDIUM SAND >.25 - .5 MM	16	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% FINE SAND >.125 - .25 MM	28	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% VERY FINE SAND >.0625 - .125 MM	5.8	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% SILT	6.7	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	% CLAY & COLLOIDS	0.7	%	ASTM D422-63	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-086	AG01157	ORGANIC CARBON, TOT.	17000	mg/Kg	C-88 @60C	20050439	738634.4	600759.97	Grayish brown fine silt - sand, gravel - rocks, some organics
GSD-088	AG01158	% GRANULE & LARGER >2 MM	26	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% VERY COURSE SAND >1 - 2 MM	13	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% COARSE SAND >.5 - 1 MM	27	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% MEDIUM SAND >.25 - .5 MM	28	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% FINE SAND >.125 - .25 MM	5.9	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% VERY FINE SAND >.0625 - .125 MM	0.7	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% SILT	0	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	% CLAY & COLLOIDS	0.9	%	ASTM D422-63	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-088	AG01158	ORGANIC CARBON, TOT.	6100	mg/Kg	C-88 @60C	20050440	738613.89	600830.93	Grayish brown coarse sand, gravel up to 1"
GSD-091	AG01159	% GRANULE & LARGER >2 MM	15	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% VERY COURSE SAND >1 - 2 MM	5.9	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% COARSE SAND >.5 - 1 MM	5.2	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% MEDIUM SAND >.25 - .5 MM	4.4	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% FINE SAND >.125 - .25 MM	4.4	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% VERY FINE SAND >.0625 - .125 MM	5.8	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% SILT	56	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	% CLAY & COLLOIDS	2.9	%	ASTM D422-63	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel
GSD-091	AG01159	ORGANIC CARBON, TOT.	83000	mg/Kg	C-88 @60C	20050441	701738.33	585192.09	Grayish brown silt, slight coarse gravel

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-093	AG01160	% GRANULE & LARGER >2 MM	1.2	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% VERY COURSE SAND >1 - 2 MM	6.1	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% COARSE SAND >.5 - 1 MM	9.3	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% MEDIUM SAND >.25 - .5 MM	9.7	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% FINE SAND >.125 - .25 MM	17	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% VERY FINE SAND >.0625 - .125 MM	9.9	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% SILT	47	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	% CLAY & COLLOIDS	0.4	%	ASTM D422-63	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-093	AG01160	ORGANIC CARBON, TOT.	75000	mg/Kg	C-88 @60C	20050442	701666.44	585330.5	Grayish olive, grayish brown silt w/ some sand
GSD-095	AG01161	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% VERY COURSE SAND >1 - 2 MM	1.3	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% COARSE SAND >.5 - 1 MM	2.1	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% MEDIUM SAND >.25 - .5 MM	5.3	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% FINE SAND >.125 - .25 MM	42	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% VERY FINE SAND >.0625 - .125 MM	19	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% SILT	27	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	% CLAY & COLLOIDS	3.2	%	ASTM D422-63	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-095	AG01161	ORGANIC CARBON, TOT.	46000	mg/Kg	C-88 @60C	20050443	701640.3	585410.84	Grayish olive silt w/ fine sand and slight organic
GSD-096	AG01162	% GRANULE & LARGER >2 MM	6.5	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% VERY COURSE SAND >1 - 2 MM	7.2	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% COARSE SAND >.5 - 1 MM	7.9	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% MEDIUM SAND >.25 - .5 MM	9.4	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% FINE SAND >.125 - .25 MM	11	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% VERY FINE SAND >.0625 - .125 MM	10	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% SILT	45	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	% CLAY & COLLOIDS	3.3	%	ASTM D422-63	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-096	AG01162	ORGANIC CARBON, TOT.	62000	mg/Kg	C-88 @60C	20050444	699083.49	584777.6	Grayish brown silt w/ trace coarse sand
GSD-098	AG01163	% GRANULE & LARGER >2 MM	23	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	% VERY COURSE SAND >1 - 2 MM	12	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	% COARSE SAND >.5 - 1 MM	15	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-098	AG01163	% MEDIUM SAND >.25 - .5 MM	14	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	% FINE SAND >.125 - .25 MM	17	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	% VERY FINE SAND >.0625 - .125 MM	5.6	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	% SILT	12	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	% CLAY & COLLOIDS	1.5	%	ASTM D422-63	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-098	AG01163	ORGANIC CARBON, TOT.	12000	mg/Kg	C-88 @60C	20050445	699056.74	584917.1	Top 3" grayish brown fine silt - sand, bottom 3" light brown clayey material
GSD-101	AG01164	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% VERY COURSE SAND >1 - 2 MM	0.2	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% COARSE SAND >.5 - 1 MM	0.3	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% MEDIUM SAND >.25 - .5 MM	0.3	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% FINE SAND >.125 - .25 MM	0.3	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% VERY FINE SAND >.0625 - .125 MM	2.4	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% SILT	89	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	% CLAY & COLLOIDS	7.9	%	ASTM D422-63	20050447	683165.2	597175.17	Dark gray silt
GSD-101	AG01164	ORGANIC CARBON, TOT.	35000	mg/Kg	C-88 @60C	20050447	683165.2	597175.17	Dark gray silt
GSD-103	AG01165	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% VERY COURSE SAND >1 - 2 MM	0.1	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% COARSE SAND >.5 - 1 MM	0	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% MEDIUM SAND >.25 - .5 MM	0.2	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% FINE SAND >.125 - .25 MM	0.3	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% VERY FINE SAND >.0625 - .125 MM	2	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% SILT	82	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	% CLAY & COLLOIDS	15	%	ASTM D422-63	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-103	AG01165	ORGANIC CARBON, TOT.	73000	mg/Kg	C-88 @60C	20050448	683249.81	597378.6	Dark gray fluffy silt
GSD-106	AG01166	% GRANULE & LARGER >2 MM	61	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	% VERY COURSE SAND >1 - 2 MM	5	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	% COARSE SAND >.5 - 1 MM	4.2	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-106	AG01166	% MEDIUM SAND >.25 - .5 MM	4.4	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	% FINE SAND >.125 - .25 MM	2.4	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	% VERY FINE SAND >.0625 - .125 MM	1.2	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	% SILT	18	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	% CLAY & COLLOIDS	4	%	ASTM D422-63	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-106	AG01166	ORGANIC CARBON, TOT.	46000	mg/Kg	C-88 @60C	20050449	685791.3	596550.9	Dark gray, olive silt w/ coarse gravel
GSD-108	AG01167	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% VERY COURSE SAND >1 - 2 MM	0.2	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% COARSE SAND >.5 - 1 MM	1	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% MEDIUM SAND >.25 - .5 MM	2.1	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% FINE SAND >.125 - .25 MM	8.8	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% VERY FINE SAND >.0625 - .125 MM	9.5	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% SILT	69	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	% CLAY & COLLOIDS	9.5	%	ASTM D422-63	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-108	AG01167	ORGANIC CARBON, TOT.	36000	mg/Kg	C-88 @60C	20050450	685974.66	597509.89	Dark gray, olive silt
GSD-111	AG01168	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% VERY COURSE SAND >1 - 2 MM	2.1	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% COARSE SAND >.5 - 1 MM	2.7	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% MEDIUM SAND >.25 - .5 MM	2.1	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% FINE SAND >.125 - .25 MM	2	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% VERY FINE SAND >.0625 - .125 MM	1.7	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% SILT	81	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	% CLAY & COLLOIDS	8.7	%	ASTM D422-63	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-111	AG01168	ORGANIC CARBON, TOT.	47000	mg/Kg	C-88 @60C	20050451	688759.47	596968.62	Dark gray, olive silt
GSD-114	AG01169	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% VERY COURSE SAND >1 - 2 MM	0.4	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% COARSE SAND >.5 - 1 MM	0.9	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% MEDIUM SAND >.25 - .5 MM	0.8	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% FINE SAND >.125 - .25 MM	1.1	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% VERY FINE SAND >.0625 - .125 MM	3.9	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% SILT	85	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	% CLAY & COLLOIDS	8.1	%	ASTM D422-63	20050452	688734.55	597170.74	Dark gray, olive silt
GSD-114	AG01169	ORGANIC CARBON, TOT.	79000	mg/Kg	C-88 @60C	20050452	688734.55	597170.74	Dark gray, olive silt

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-116	AG01170	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% VERY COURSE SAND >1 - 2 MM	0.4	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% COARSE SAND >.5 - 1 MM	0.9	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% MEDIUM SAND >.25 - .5 MM	0.8	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% FINE SAND >.125 - .25 MM	1	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% VERY FINE SAND >.0625 - .125 MM	3.6	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% SILT	86	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	% CLAY & COLLOIDS	7.3	%	ASTM D422-63	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-116	AG01170	ORGANIC CARBON, TOT.	63000	mg/Kg	C-88 @60C	20050453	691002.93	597534.58	Dark gray, olive silt
GSD-119	AG01171	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% VERY COURSE SAND >1 - 2 MM	1.7	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% COARSE SAND >.5 - 1 MM	2.7	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% MEDIUM SAND >.25 - .5 MM	3	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% FINE SAND >.125 - .25 MM	8.4	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% VERY FINE SAND >.0625 - .125 MM	5.1	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% SILT	75	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	% CLAY & COLLOIDS	4.3	%	ASTM D422-63	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-119	AG01171	ORGANIC CARBON, TOT.	67000	mg/Kg	C-88 @60C	20050454	690946.83	597754.66	Dark gray, olive silt
GSD-122	AG01172	% GRANULE & LARGER >2 MM	2.3	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% VERY COURSE SAND >1 - 2 MM	3.7	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% COARSE SAND >.5 - 1 MM	3.3	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% MEDIUM SAND >.25 - .5 MM	4.3	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% FINE SAND >.125 - .25 MM	5.9	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% VERY FINE SAND >.0625 - .125 MM	6.2	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% SILT	70	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	% CLAY & COLLOIDS	4.3	%	ASTM D422-63	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-122	AG01172	ORGANIC CARBON, TOT.	53000	mg/Kg	C-88 @60C	20050455	693530.93	598511.82	Dark gray, olive silt w/ a small amount of coarse sand
GSD-124	AG01173	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	% VERY COURSE SAND >1 - 2 MM	0.4	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	% COARSE SAND >.5 - 1 MM	0.7	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	% MEDIUM SAND >.25 - .5 MM	1.8	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	% FINE SAND >.125 - .25 MM	4.5	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	% VERY FINE SAND >.0625 - .125 MM	43	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-124	AG01173	% SILT	48	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	% CLAY & COLLOIDS	1.7	%	ASTM D422-63	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-124	AG01173	ORGANIC CARBON, TOT.	38000	mg/Kg	C-88 @60C	20050456	693529.44	598128.83	Dark gray, olive silt w/ fine sand
GSD-126	AG01174	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% VERY COURSE SAND >1 - 2 MM	0.8	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% COARSE SAND >.5 - 1 MM	1.3	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% MEDIUM SAND >.25 - .5 MM	2.2	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% FINE SAND >.125 - .25 MM	4.4	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% VERY FINE SAND >.0625 - .125 MM	15	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% SILT	69	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	% CLAY & COLLOIDS	7.7	%	ASTM D422-63	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-126	AG01174	ORGANIC CARBON, TOT.	70000	mg/Kg	C-88 @60C	20050457	695290.13	596318.74	Dark gray, olive silt w/ some organic matter
GSD-128	AG01175	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% VERY COURSE SAND >1 - 2 MM	1.1	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% COARSE SAND >.5 - 1 MM	4.9	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% MEDIUM SAND >.25 - .5 MM	4.5	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% FINE SAND >.125 - .25 MM	8.1	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% VERY FINE SAND >.0625 - .125 MM	7.7	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% SILT	66	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	% CLAY & COLLOIDS	7.5	%	ASTM D422-63	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-128	AG01175	ORGANIC CARBON, TOT.	45000	mg/Kg	C-88 @60C	20050458	695601.8	596275.52	Dark gray, olive silt w/ some medium sand
GSD-132	AG01176	% GRANULE & LARGER >2 MM	30	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	% VERY COURSE SAND >1 - 2 MM	7.2	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	% COARSE SAND >.5 - 1 MM	8.7	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	% MEDIUM SAND >.25 - .5 MM	10	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	% FINE SAND >.125 - .25 MM	8.3	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	% VERY FINE SAND >.0625 - .125 MM	6.5	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-132	AG01176	% SILT	29	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	% CLAY & COLLOIDS	0.3	%	ASTM D422-63	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-132	AG01176	ORGANIC CARBON, TOT.	41000	mg/Kg	C-88 @60C	20050459	695675.31	594092.1	Dark gray, olive silt, fine gravel and coarse sand (large rock along bulkhead)
GSD-134	AG01177	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% VERY COURSE SAND >1 - 2 MM	1.4	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% COARSE SAND >.5 - 1 MM	5.1	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% MEDIUM SAND >.25 - .5 MM	3.8	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% FINE SAND >.125 - .25 MM	5.1	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% VERY FINE SAND >.0625 - .125 MM	14	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% SILT	64	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	% CLAY & COLLOIDS	6.3	%	ASTM D422-63	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-134	AG01177	ORGANIC CARBON, TOT.	49000	mg/Kg	C-88 @60C	20050460	695323.22	594142.61	Dark gray, olive silt
GSD-136	AG01178	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% VERY COURSE SAND >1 - 2 MM	0.1	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% COARSE SAND >.5 - 1 MM	4.5	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% MEDIUM SAND >.25 - .5 MM	4.3	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% FINE SAND >.125 - .25 MM	4.3	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% VERY FINE SAND >.0625 - .125 MM	9.7	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% SILT	68	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	% CLAY & COLLOIDS	9	%	ASTM D422-63	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-136	AG01178	ORGANIC CARBON, TOT.	55000	mg/Kg	C-88 @60C	20050461	694593.44	591701.67	Dark gray, olive silt
GSD-138	AG01179	% GRANULE & LARGER >2 MM	1.5	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% VERY COURSE SAND >1 - 2 MM	3.1	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% COARSE SAND >.5 - 1 MM	7.2	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% MEDIUM SAND >.25 - .5 MM	13	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% FINE SAND >.125 - .25 MM	19	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% VERY FINE SAND >.0625 - .125 MM	9.9	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% SILT	46	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	% CLAY & COLLOIDS	1.2	%	ASTM D422-63	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand
GSD-138	AG01179	ORGANIC CARBON, TOT.	47000	mg/Kg	C-88 @60C	20050462	694715.16	591605.2	Dark gray, olive silt w/ fine sand

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-171	AG01405	% GRANULE & LARGER >2 MM	78	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% VERY COURSE SAND >1 - 2 MM	8.4	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% COARSE SAND >.5 - 1 MM	5.6	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% MEDIUM SAND >.25 - .5 MM	2.5	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% FINE SAND >.125 - .25 MM	3.4	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% VERY FINE SAND >.0625 - .125 MM	0.8	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% SILT	0.8	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	% CLAY & COLLOIDS	0.1	%	ASTM D422-63	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-171	AG01405	ORGANIC CARBON, TOT.	8400	mg/Kg	C-88 @60C	20050605	739520.93	600641.6	Cobble w/ Brownish Gray, coarse and medium gravel, coarse and medium sand
GSD-172	AG01406	% GRANULE & LARGER >2 MM	34	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% VERY COURSE SAND >1 - 2 MM	11	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% COARSE SAND >.5 - 1 MM	13	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% MEDIUM SAND >.25 - .5 MM	18	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% FINE SAND >.125 - .25 MM	15	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% VERY FINE SAND >.0625 - .125 MM	4.6	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% SILT	3.3	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	% CLAY & COLLOIDS	0.5	%	ASTM D422-63	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-172	AG01406	ORGANIC CARBON, TOT.	6400	mg/Kg	C-88 @60C	20050606	737347.09	600821.03	Grayish brown medium fine sand and fine gravel w/ some silt
GSD-176	AG01407	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	% VERY COURSE SAND >1 - 2 MM	1.6	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-176	AG01407	% COARSE SAND >.5 - 1 MM	2.6	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	% MEDIUM SAND >.25 - .5 MM	12	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	% FINE SAND >.125 - .25 MM	48	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	% VERY FINE SAND >.0625 - .125 MM	17	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	% SILT	16	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	% CLAY & COLLOIDS	1.8	%	ASTM D422-63	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-176	AG01407	ORGANIC CARBON, TOT.	25000	mg/Kg	C-88 @60C	20050607	737689.17	597417.46	Grayish brown fine sand - silt w/ organic
GSD-180	AG01408	% GRANULE & LARGER >2 MM	21	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% VERY COURSE SAND >1 - 2 MM	8.8	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% COARSE SAND >.5 - 1 MM	16	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% MEDIUM SAND >.25 - .5 MM	18	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% FINE SAND >.125 - .25 MM	20	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% VERY FINE SAND >.0625 - .125 MM	11	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% SILT	5	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	% CLAY & COLLOIDS	0.9	%	ASTM D422-63	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-180	AG01408	ORGANIC CARBON, TOT.	13000	mg/Kg	C-88 @60C	20050608	734886.17	597460.01	Grayish olive fine sandy w/ fine gravel some organic
GSD-185	AG01409	% GRANULE & LARGER >2 MM	0.8	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% VERY COURSE SAND >1 - 2 MM	1.4	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% COARSE SAND >.5 - 1 MM	3	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% MEDIUM SAND >.25 - .5 MM	36	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% FINE SAND >.125 - .25 MM	55	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% VERY FINE SAND >.0625 - .125 MM	2.4	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% SILT	1.9	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-185	AG01409	ORGANIC CARBON, TOT.	7000	mg/Kg	C-88 @60C	20050609	734505	597246	Grayish olive fine sandy w/silt
GSD-189	AG01410	% GRANULE & LARGER >2 MM	27	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% VERY COURSE SAND >1 - 2 MM	15	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% COARSE SAND >.5 - 1 MM	23	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% MEDIUM SAND >.25 - .5 MM	25	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% FINE SAND >.125 - .25 MM	7.9	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% VERY FINE SAND >.0625 - .125 MM	0.7	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% SILT	0.5	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-189	AG01410	% CLAY & COLLOIDS	0.4	%	ASTM D422-63	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-189	AG01410	ORGANIC CARBON, TOT.	5600	mg/Kg	C-88 @60C	20050610	728124.69	596985.03	Brownish gray medium to coarse sand with fine gravel
GSD-193	AG01411	% GRANULE & LARGER >2 MM	16	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% VERY COURSE SAND >1 - 2 MM	5.6	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% COARSE SAND >.5 - 1 MM	14	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% MEDIUM SAND >.25 - .5 MM	30	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% FINE SAND >.125 - .25 MM	14	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% VERY FINE SAND >.0625 - .125 MM	7.5	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% SILT	13	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-193	AG01411	ORGANIC CARBON, TOT.	7400	mg/Kg	C-88 @60C	20050611	723764.4	594667.87	Grayish brown medium sand w/ silt organic matter
GSD-197	AG01412	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% VERY COURSE SAND >1 - 2 MM	0.3	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% COARSE SAND >.5 - 1 MM	1.6	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% MEDIUM SAND >.25 - .5 MM	60	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% FINE SAND >.125 - .25 MM	36	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% VERY FINE SAND >.0625 - .125 MM	1.3	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% SILT	1.2	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-197	AG01412	ORGANIC CARBON, TOT.	2500	mg/Kg	C-88 @60C	20050612	722025.84	592371.54	Brownish gray fine sand w/ some organic matter
GSD-182	AG01413	% GRANULE & LARGER >2 MM	0.2	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% VERY COURSE SAND >1 - 2 MM	1.2	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% COARSE SAND >.5 - 1 MM	2.7	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% MEDIUM SAND >.25 - .5 MM	29	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% FINE SAND >.125 - .25 MM	53	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% VERY FINE SAND >.0625 - .125 MM	4.8	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% SILT	8.7	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	% CLAY & COLLOIDS	1.1	%	ASTM D422-63	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-182	AG01413	ORGANIC CARBON, TOT.	9200	mg/Kg	C-88 @60C	20050613	734900	597355	Grayish olive fine sand w/silt
GSD-200	AG01414	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	% VERY COURSE SAND >1 - 2 MM	0.1	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	% COARSE SAND >.5 - 1 MM	0.4	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	% MEDIUM SAND >.25 - .5 MM	1.6	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	% FINE SAND >.125 - .25 MM	66	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-200	AG01414	% VERY FINE SAND >.0625 - .125 MM	17	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	% SILT	13	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	% CLAY & COLLOIDS	2.3	%	ASTM D422-63	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-200	AG01414	ORGANIC CARBON, TOT.	13000	mg/Kg	C-88 @60C	20050627	717339.33	592086.92	Grayish olive fine silt - fine sand
GSD-207	AG01415	% GRANULE & LARGER >2 MM	5.7	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% VERY COURSE SAND >1 - 2 MM	17	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% COARSE SAND >.5 - 1 MM	51	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% MEDIUM SAND >.25 - .5 MM	25	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% FINE SAND >.125 - .25 MM	0.7	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% VERY FINE SAND >.0625 - .125 MM	0.3	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% SILT	0.8	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-207	AG01415	ORGANIC CARBON, TOT.	1300	mg/Kg	C-88 @60C	20050628	709318.69	589573.53	Grayish brown coarse sand, trace gravel, trace organics
GSD-209	AG01416	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% VERY COURSE SAND >1 - 2 MM	0	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% COARSE SAND >.5 - 1 MM	1	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% MEDIUM SAND >.25 - .5 MM	2.8	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% FINE SAND >.125 - .25 MM	3.6	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% VERY FINE SAND >.0625 - .125 MM	8.5	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% SILT	74	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	% CLAY & COLLOIDS	10	%	ASTM D422-63	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-209	AG01416	ORGANIC CARBON, TOT.	65000	mg/Kg	C-88 @60C	20050629	704819.39	587103.68	Grayish brown silt, slight organics
GSD-211	AG01417	% GRANULE & LARGER >2 MM	6.6	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% VERY COURSE SAND >1 - 2 MM	2.9	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% COARSE SAND >.5 - 1 MM	8.2	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% MEDIUM SAND >.25 - .5 MM	18	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% FINE SAND >.125 - .25 MM	17	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% VERY FINE SAND >.0625 - .125 MM	12	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% SILT	34	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	% CLAY & COLLOIDS	1.2	%	ASTM D422-63	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-211	AG01417	ORGANIC CARBON, TOT.	52000	mg/Kg	C-88 @60C	20050630	703052.57	586338.02	Grayish brown top 2" fine sand, bottom silt
GSD-215	AG01418	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	% VERY COURSE SAND >1 - 2 MM	0.6	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-215	AG01418	% COARSE SAND >.5 - 1 MM	16	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	% MEDIUM SAND >.25 - .5 MM	51	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	% FINE SAND >.125 - .25 MM	22	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	% VERY FINE SAND >.0625 - .125 MM	7.2	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	% SILT	2.9	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	% CLAY & COLLOIDS	0.5	%	ASTM D422-63	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-215	AG01418	ORGANIC CARBON, TOT.	5900	mg/Kg	C-88 @60C	20050631	698379.68	584809.66	Grayish brown sand w/ slight silt, trace organics
GSD-219	AG01419	% GRANULE & LARGER >2 MM	8.2	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% VERY COURSE SAND >1 - 2 MM	7	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% COARSE SAND >.5 - 1 MM	12	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% MEDIUM SAND >.25 - .5 MM	18	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% FINE SAND >.125 - .25 MM	15	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% VERY FINE SAND >.0625 - .125 MM	7.6	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% SILT	28	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	% CLAY & COLLOIDS	4.6	%	ASTM D422-63	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-219	AG01419	ORGANIC CARBON, TOT.	35000	mg/Kg	C-88 @60C	20050632	692892.4	586095.99	Grayish brown silt w/ slight gravel and rocks
GSD-222	AG01420	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% VERY COURSE SAND >1 - 2 MM	0.3	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% COARSE SAND >.5 - 1 MM	1.2	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% MEDIUM SAND >.25 - .5 MM	3	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% FINE SAND >.125 - .25 MM	22	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% VERY FINE SAND >.0625 - .125 MM	26	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% SILT	43	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	% CLAY & COLLOIDS	5.1	%	ASTM D422-63	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-222	AG01420	ORGANIC CARBON, TOT.	53000	mg/Kg	C-88 @60C	20050633	693130.15	586081.2	Grayish brown silt w/ slight organics
GSD-226	AG01421	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% VERY COURSE SAND >1 - 2 MM	0.1	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% COARSE SAND >.5 - 1 MM	0.4	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% MEDIUM SAND >.25 - .5 MM	2	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% FINE SAND >.125 - .25 MM	60	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% VERY FINE SAND >.0625 - .125 MM	34	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% SILT	1.5	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-226	AG01421	% CLAY & COLLOIDS	2.3	%	ASTM D422-63	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-226	AG01421	ORGANIC CARBON, TOT.	14000	mg/Kg	C-88 @60C	20050634	693299.58	590638.78	Grayish brown fine sand w/ trace silt and organics
GSD-232	AG01422	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% VERY COURSE SAND >1 - 2 MM	1.3	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% COARSE SAND >.5 - 1 MM	3.6	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% MEDIUM SAND >.25 - .5 MM	2.7	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% FINE SAND >.125 - .25 MM	3.2	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% VERY FINE SAND >.0625 - .125 MM	17	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% SILT	70	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	% CLAY & COLLOIDS	2.3	%	ASTM D422-63	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-232	AG01422	ORGANIC CARBON, TOT.	62000	mg/Kg	C-88 @60C	20050635	689732.39	597367.49	Grayish brown silt w/ slight organics
GSD-239	AG01423	ORGANIC CARBON, TOT.	39000	mg/Kg	C-88 @60C	20050650	738363.92	597794.93	Multi-colored coarse and medium sand and fine gravel
GSD-241	AG01424	% GRANULE & LARGER >2 MM	7.1	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% VERY COURSE SAND >1 - 2 MM	6.8	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% COARSE SAND >.5 - 1 MM	21	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% MEDIUM SAND >.25 - .5 MM	53	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% FINE SAND >.125 - .25 MM	8.5	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% VERY FINE SAND >.0625 - .125 MM	0.8	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% SILT	2.6	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	% CLAY & COLLOIDS	0	%	ASTM D422-63	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-241	AG01424	ORGANIC CARBON, TOT.	25000	mg/Kg	C-88 @60C	20050651	734651.3	597221.15	Light olive, brown to brownish gray fine and medium sand with some gravel and organic
GSD-243	AG01425	% GRANULE & LARGER >2 MM	32	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	% VERY COURSE SAND >1 - 2 MM	7	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	% COARSE SAND >.5 - 1 MM	8.7	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	% MEDIUM SAND >.25 - .5 MM	15	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-243	AG01425	% FINE SAND >.125 - .25 MM	24	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	% VERY FINE SAND >.0625 - .125 MM	6.4	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	% SILT	4.4	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	% CLAY & COLLOIDS	2.8	%	ASTM D422-63	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-243	AG01425	ORGANIC CARBON, TOT.	17000	mg/Kg	C-88 @60C	20050652	734370.59	597257.71	Brownish gray fine sand, silt w/ some fine gravel, organic
GSD-247	AG01426	% GRANULE & LARGER >2 MM	24	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% VERY COURSE SAND >1 - 2 MM	32	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% COARSE SAND >.5 - 1 MM	32	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% MEDIUM SAND >.25 - .5 MM	9.7	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% FINE SAND >.125 - .25 MM	1.2	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% VERY FINE SAND >.0625 - .125 MM	0.5	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% SILT	0	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	% CLAY & COLLOIDS	1.5	%	ASTM D422-63	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-247	AG01426	ORGANIC CARBON, TOT.	27000	mg/Kg	C-88 @60C	20050653	723417.77	593311.72	Brownish gray medium and coarse sand, organic matter
GSD-252	AG01427	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% VERY COURSE SAND >1 - 2 MM	1.4	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% COARSE SAND >.5 - 1 MM	3.6	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% MEDIUM SAND >.25 - .5 MM	20	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% FINE SAND >.125 - .25 MM	37	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% VERY FINE SAND >.0625 - .125 MM	7.6	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% SILT	24	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	% CLAY & COLLOIDS	5.8	%	ASTM D422-63	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-252	AG01427	ORGANIC CARBON, TOT.	39000	mg/Kg	C-88 @60C	20050654	714903.46	591647.48	Brownish gray fine and medium sand, organic
GSD-254	AG01428	% GRANULE & LARGER >2 MM	1.5	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% VERY COURSE SAND >1 - 2 MM	2.1	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% COARSE SAND >.5 - 1 MM	4.2	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% MEDIUM SAND >.25 - .5 MM	5.3	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% FINE SAND >.125 - .25 MM	15	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% VERY FINE SAND >.0625 - .125 MM	21	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% SILT	46	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	% CLAY & COLLOIDS	3.9	%	ASTM D422-63	20050655	707722.32	588595.96	Grayish brown silt
GSD-254	AG01428	ORGANIC CARBON, TOT.	40000	mg/Kg	C-88 @60C	20050655	707722.32	588595.96	Grayish brown silt
GSD-258	AG01429	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-258	AG01429	% VERY COURSE SAND >1 - 2 MM	0.2	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	% COARSE SAND >.5 - 1 MM	1.3	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	% MEDIUM SAND >.25 - .5 MM	1.5	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	% FINE SAND >.125 - .25 MM	2.2	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	% VERY FINE SAND >.0625 - .125 MM	20	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	% SILT	65	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	% CLAY & COLLOIDS	10	%	ASTM D422-63	20050656	685812.23	596695.92	Dark grayish olive
GSD-258	AG01429	ORGANIC CARBON, TOT.	47000	mg/Kg	C-88 @60C	20050656	685812.23	596695.92	Dark grayish olive
GSD-262	AG01430	% GRANULE & LARGER >2 MM	1.4	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% VERY COURSE SAND >1 - 2 MM	1.7	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% COARSE SAND >.5 - 1 MM	3.5	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% MEDIUM SAND >.25 - .5 MM	4.1	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% FINE SAND >.125 - .25 MM	3.2	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% VERY FINE SAND >.0625 - .125 MM	4.3	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% SILT	54	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	% CLAY & COLLOIDS	28	%	ASTM D422-63	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-262	AG01430	ORGANIC CARBON, TOT.	2400	mg/Kg	C-88 @60C	20050657	682716.43	597692.36	Moderate yellowish brown dense clay
GSD-266	AG01431	% GRANULE & LARGER >2 MM	1.9	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% VERY COURSE SAND >1 - 2 MM	1.4	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% COARSE SAND >.5 - 1 MM	8	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% MEDIUM SAND >.25 - .5 MM	6.4	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% FINE SAND >.125 - .25 MM	3.4	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% VERY FINE SAND >.0625 - .125 MM	5.1	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% SILT	67	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	% CLAY & COLLOIDS	7.1	%	ASTM D422-63	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-266	AG01431	ORGANIC CARBON, TOT.	46000	mg/Kg	C-88 @60C	20050658	695170.09	592167.13	Dark grayish brown silt
GSD-270	AG01432	% GRANULE & LARGER >2 MM	0	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	% VERY COURSE SAND >1 - 2 MM	0.9	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	% COARSE SAND >.5 - 1 MM	3	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	% MEDIUM SAND >.25 - .5 MM	4.1	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	% FINE SAND >.125 - .25 MM	6.6	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	% VERY FINE SAND >.0625 - .125 MM	21	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	% SILT	57	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt

GSD Number	Sample ID	Analyte Name	Result	Units	Analysis or Reference	Station ID	Northing	Easting	Notes
GSD-270	AG01432	% CLAY & COLLOIDS	7.6	%	ASTM D422-63	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-270	AG01432	ORGANIC CARBON, TOT.	43000	mg/Kg	C-88 @60C	20050659	695092.82	585033.4	Dark grayish olive silt
GSD-273	AG01433	% GRANULE & LARGER >2 MM	1	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% VERY COURSE SAND >1 - 2 MM	0.8	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% COARSE SAND >.5 - 1 MM	2.9	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% MEDIUM SAND >.25 - .5 MM	6.7	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% FINE SAND >.125 - .25 MM	50	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% VERY FINE SAND >.0625 - .125 MM	16	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% SILT	17	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	% CLAY & COLLOIDS	5.3	%	ASTM D422-63	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic
GSD-273	AG01433	ORGANIC CARBON, TOT.	75000	mg/Kg	C-88 @60C	20050660	701938.51	585504.04	Dark grayish brown silt w/ organic

Appendix C

Comparison of Surficial Sediment Classification Sources

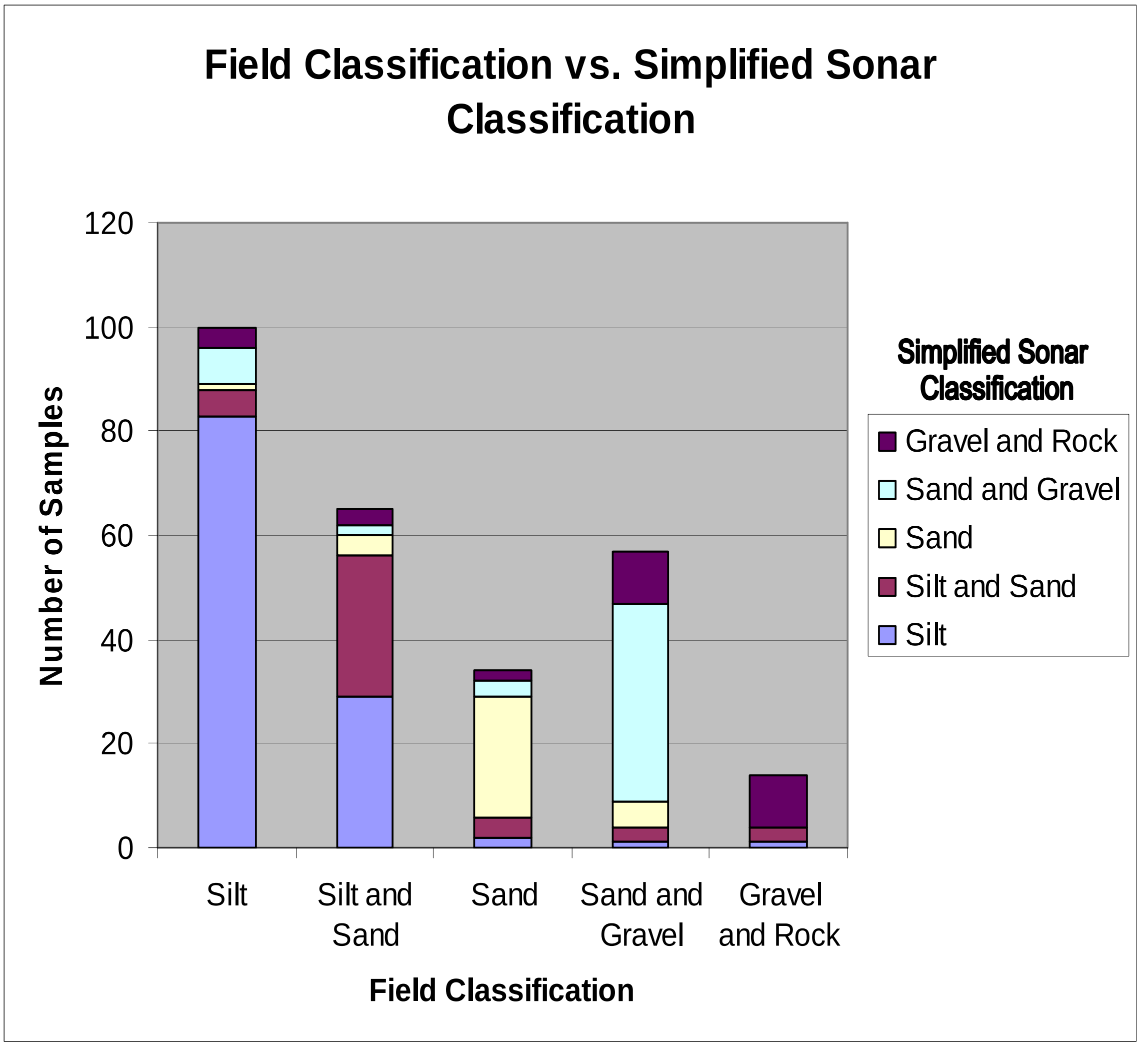
Comparison of Surficial Sediment Classification Sources

The results from the DESA grain size analysis, field geologist characterization, and simplified sonar classifications were compared at the short core sampling locations to determine statistically how similar the results are between the different analytical sources to gain confidence in the results.

The DESA results were classified into one of five categories based on the median statistical value in the results (silt, fine sand, medium sand, coarse sand, gravel). The field geologist classification results were separated into these same five categories as closely as possible for comparison to the DESA results. The simplified sonar classifications were separated into the five categories used in the GIS (silt, silt and sand, sand, sand and gravel, gravel and rock). The field geologist classifications results were also separated into these same five categories as closely as possible for comparison to the simplified sonar classification results.

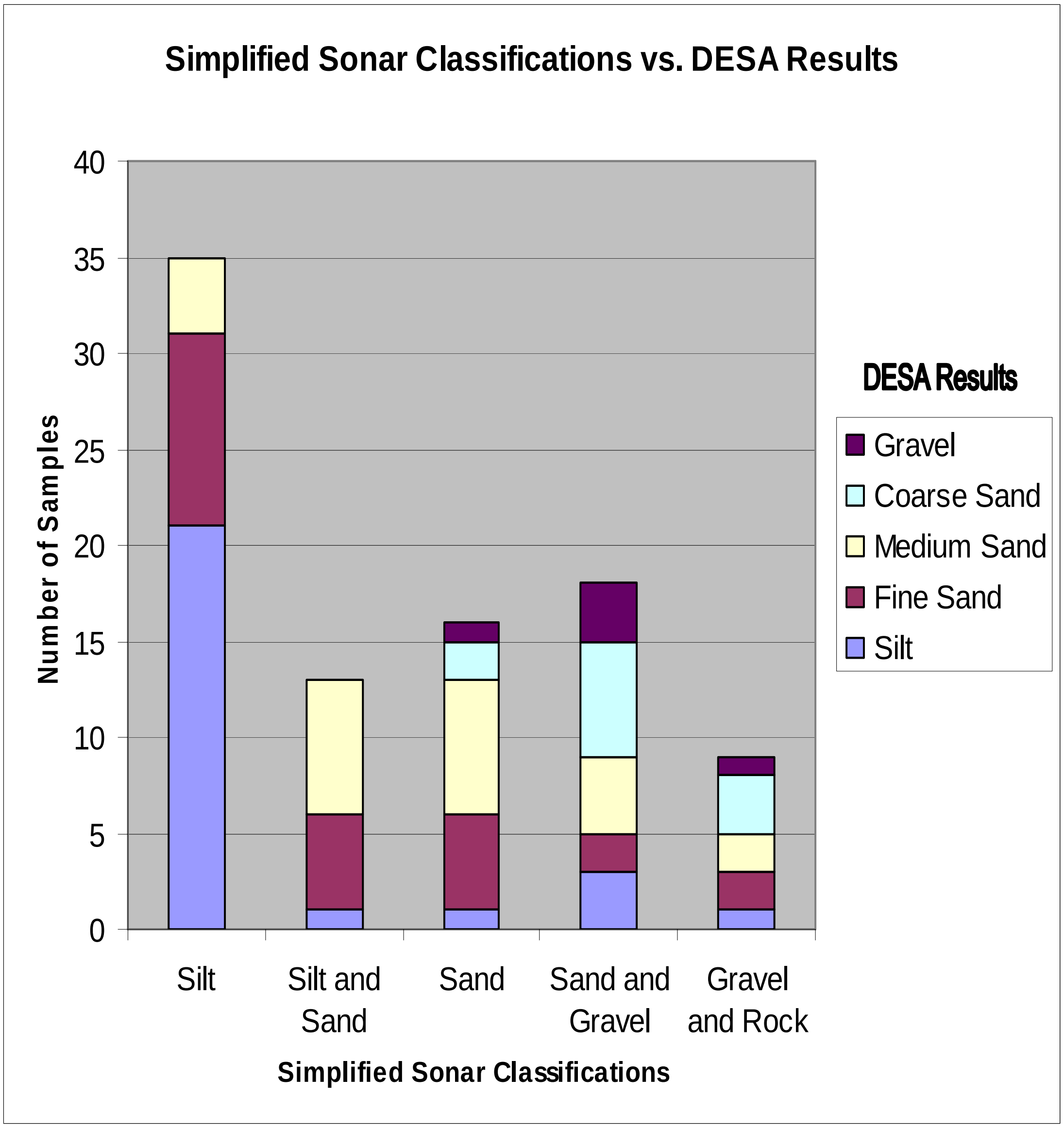
In the Lower Passaic River, shoreline improvements and other activities have disturbed the riverbed and deposited non-native materials. In order to designate a single classification to the DESA laboratory results, the mathematical median of the grain size results was used as the single designation for that sample. The basic underlying assumption in comparing the field geologist characterizations and simplified sonar classifications with the DESA results is that the median value in the DESA results is also the dominant material, which it is not in almost 25 percent of the comparisons. There are cases where the DESA results dominant fractions are gravel and silt, the field classification was gravel and silt, but the statistical median value was medium sand (eg. GSD-018). Though the statistical comparison would indicate that the field classification does not match the DESA analysis, it clearly does. There are also cases where the dominant fraction is silt, yet the statistical median is fine sand (eg. GSD-023).

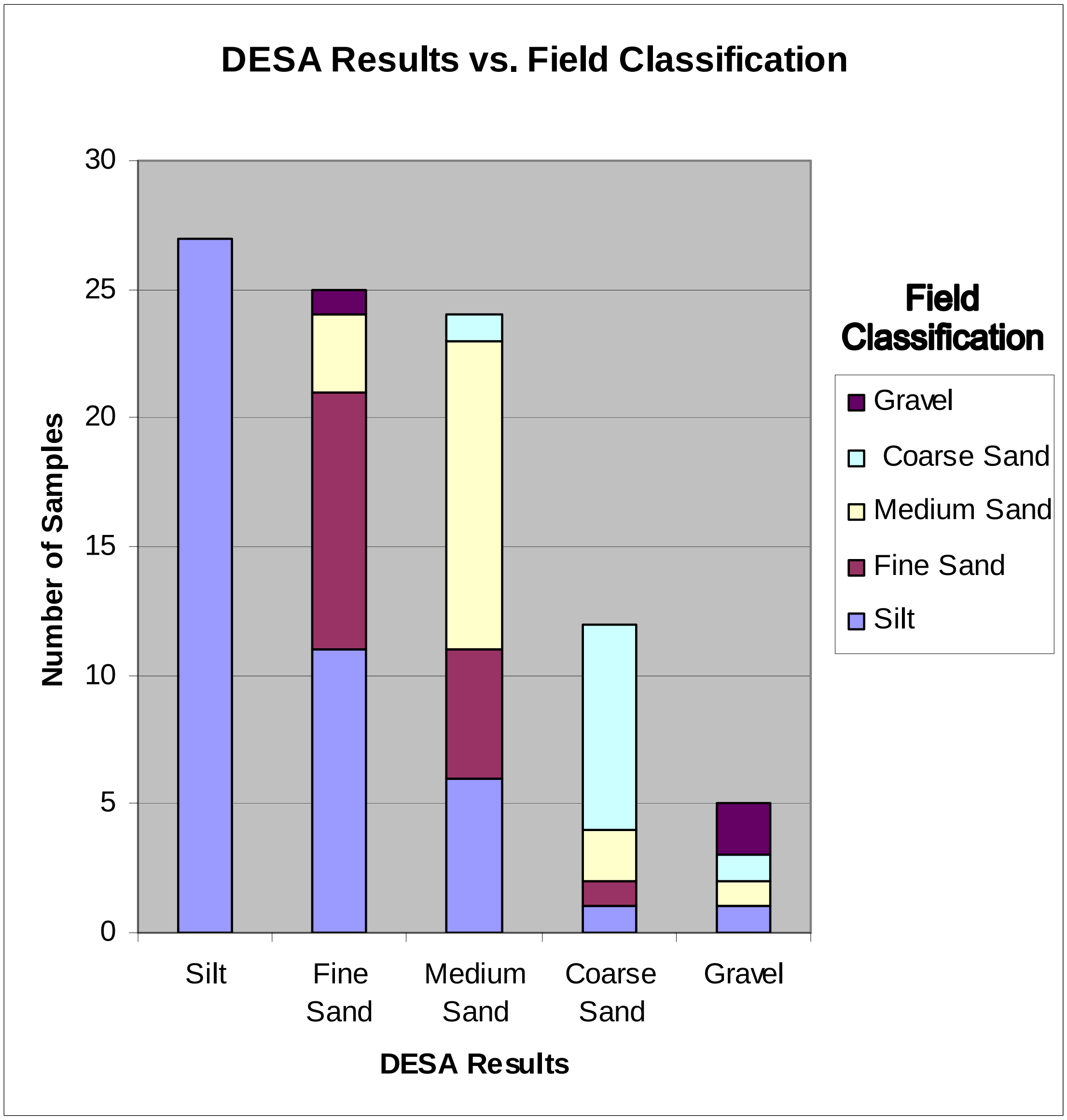
The sampling methodology (narrow push core) worked fine for some sediment types, however where the dominant material was larger than the diameter of the push core, the sample taken is not a true representation of the material present. If the material was rock, the push core collected samples between the rocks and found silt, sand, and/or gravel.



Field Classification vs. Simplified Sonar Classification
120
100
80
60
40
20
0
Number of Samples
Silt
Silt and Sand
Sand
Sand and Gravel
Gravel and Rock
Field Classification
Simplified Sonar Classification
Gravel and Rock
Sand and Gravel
Sand
Silt and Sand
Silt

R2-0007510


Simplified Sonar Classifications vs. DESA Results
Number of Samples
0
5
10
15
20
25
30
35
40
Silt
Silt and Sand
Sand
Sand and Gravel
Gravel and Rock
Simplified Sonar Classifications
DESA Results
Gravel
Coarse Sand
Medium Sand
Fine Sand
Silt


DESA Results vs. Field Classification
Number of Samples
30
25
20
15
10
5
0
Silt
Fine Sand
Medium Sand
Coarse Sand
Gravel
DESA Results
Field Classification
Gravel
Coarse Sand
Medium Sand
Fine Sand
Silt

Appendix D

Sub-Bottom Profiler Ground Truthing Logs and Lab Analysis

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
1A
Time: 1240

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/10/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 0**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 -92"						0 -92"	Soft Silt w/Medium Plasticity	ML	Very Dark Gray (5YR 3/1)
										Sample # 36 (77 - 92")
2	92 - 110"						92 - 110"	Firm Clayey Silt	CL/ML	Black (5YR 2.5/1)
3	110 - 131"						110 - 131"	Tight Clay	CL	Reddish Brown (5YR 5/3)
								Refusal @ 184" (15.2-ft.)		East: 597443.4 North: 682601.0 Core Barrel Advanced: 184" Recovery: 131"

R2-0007514

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-01A	20050760		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-01A	20050760		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-01A	20050760		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	57.36%	%
DC-01A	20050760		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	42.64%	%
DC-01A	20050760		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	49.3	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	100.00%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.93%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	99.87%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	99.74%	%
DC-01A	20050760		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	98.39%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.028197	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018650	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011219	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008150	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.005974	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003076	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001321	mm
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	87.50%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	77.08%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	66.67%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	59.38%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	48.96%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	33.33%	%
DC-01A	20050760		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	22.92%	%
DC-01A	20050760		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	78.97	%
DC-01A	20050760		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	42.88	%
DC-01A	20050760		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	36.09	%
DC-01A	20050760		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	79.26	%
DC-01A	20050760		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	42.88	%
DC-01A	20050760		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density	0.704	%
DC-01A	20050760		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	35,498	ppm
DC-01A	20050760		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	3.55	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
1B
Time: 1258

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/13/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 0**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 -22"						0 -22"	Very Tight Clay	CL	Reddish Brown (5YR 5/3)
										Sample # 37 (0 - 22")
2	22 - 28"						22 - 28"	Well Graded Fine Sand	SW	Reddish Brown (5YR 5/3)
										East: 597689.4 North: 682760.2
								Refusal @ 60"		Core Barrel Advanced: 60" Recovery: 28"

R2-0007516

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-01B	20050764		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-01B	20050764		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-01B	20050764		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	54.33%	%
DC-01B	20050764		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	45.67%	%
DC-01B	20050764		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	18.6	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.97%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.85%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	99.63%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	99.26%	%
DC-01B	20050764		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	97.89%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.027257	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018000	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.010860	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.007965	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.005848	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003027	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001313	mm
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	90.91%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	81.82%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	71.72%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	62.63%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	52.53%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	36.36%	%
DC-01B	20050764		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	23.23%	%
DC-01B	20050764		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	25.50	%
DC-01B	20050764		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	17.16	%
DC-01B	20050764		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	8.34	%
DC-01B	20050764		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	26.50	%
DC-01B	20050764		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	17.16	%
DC-01B	20050764		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density	1.333	%
DC-01B	20050764		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,296	ppm
DC-01B	20050764		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.13	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
1C
Time: 1335

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/13/2005
JOB NUMBER:	3473007	LOCATION:	Mile 0
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Hazy and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 -21"						0 - 21"	Poorly Graded Fine - Medium Sand w/Silt and Gravel (~25% Fines / <15% Fine Gravel(	SP	Very Dark Gray (5YR 3/1)
2	21 - 27"						21 - 27"	Poorly Graded Coarse Sand w/Fine - Medium Gravel (~20% Gravel)	SP	Gray (5YR 5/1)
										Sample # 38 (21 - 28")
3	27 - 32"						27 - 32"	Sandy Clay (<15% Sand)	CL	Gray (5YR 5/1)
4	32 - 46"						32 - 46"	Silty Clay	ML	Dark Reddish Brown (10YR 3/4)
5	46 - 96"						46 - 96"	Stiff Clay w/Low Plasticity	CL	Dark Reddish Brown (10YR 3/4)
										East: 597785.3 North: 682782.2
								Refusal @ 114"		Core Barrel Advanced: 114" Recovery: 96"

R2-0007518

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-01C	20050765		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	30.44%	%
DC-01C	20050765		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	58.69%	%
DC-01C	20050765		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	6.28%	%
DC-01C	20050765		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	4.59%	%
DC-01C	20050765		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	11.8	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	97.13%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	87.10%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	69.56%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	56.61%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	43.06%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	36.21%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	32.78%	%
DC-01C	20050765		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	29.55%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035975	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023078	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013324	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009474	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006736	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001383	mm
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	16.00%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	11.00%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	11.00%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	9.00%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	7.00%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	5.00%	%
DC-01C	20050765		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	5.00%	%
DC-01C	20050765		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-01C	20050765		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-01C	20050765		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-01C	20050765		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-01C	20050765		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-01C	20050765		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density	1.720	%
DC-01C	20050765		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	4,250	ppm
DC-01C	20050765		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.43	%

<1> Sample did not exhibit plastic qualities due to the amount of sand and gravel present.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
1A-A
Time: 1654

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/13/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 1**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 32"						0 - 32"	Silt	ML	Very Dark Gray (7.5YR 3/3)
2	32 - 36"						32 - 36"	Silt w/Fine Sand (~20% Fine Sand)	ML	Very Dark Gray (7.5YR 3/3)
3	36 - 89"						36 - 89"	Silt w/Trace Amount of Fine Sand (>5% Fine Sand)	ML	Olive Borwn (2.5YR 4/3)
4	89 - 149"						89 - 149"	Poorly Graded Fine Sand w/Silt (>15% Fines)	SP	Olive Borwn (2.5YR 4/3)
5	149 - 173"						149 - 173"	Peat	OL	Very Dark Gray (7.5YR 3/3)
6	173 - 209"						173 - 209"	Clay	CL	Moderate Reddish Brown (10YR 4/6)
7	209 - 240"						209 - 240"	Silt w/Fine Sand (~20% Fine Sand)	ML	Moderate Reddish Brown (10YR 4/6)
8	240 - 271"						240 - 271"	Well Graded Fine-Medium Sand	SW	Moderate Yellowish Brown (10YR 5/4) **Sample # 32 (245 - 265")**
								Refusal @ 348" (29-ft.)		East: 597245.9 North: 687178.1 Core Barrel Advanced: 348" Recovery: 276"

R2-0007520

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-01A-A	20050761		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-01A-A	20050761		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-01A-A	20050761		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	64.87%	%
DC-01A-A	20050761		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	35.13%	%
DC-01A-A	20050761		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	57.7	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.97%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.91%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	99.85%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	99.73%	%
DC-01A-A	20050761		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	98.25%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.027932	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018650	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011352	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008360	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006219	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003162	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001345	mm
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	90.53%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	77.89%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	64.21%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	52.63%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	36.84%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	24.21%	%
DC-01A-A	20050761		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	16.84%	%
DC-01A-A	20050761		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	77.59	%
DC-01A-A	20050761		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	45.21	%
DC-01A-A	20050761		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	32.38	%
DC-01A-A	20050761		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	78.17	%
DC-01A-A	20050761		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	45.21	%
DC-01A-A	20050761		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.545	
DC-01A-A	20050761		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	40,086	ppm
DC-01A-A	20050761		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	4.01	%

<1> Sample did not exhibit plastic qualities due to the amount of sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
1A-B
Time: 1514

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/13/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 1**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 186"						0 - 15.5'	Elastic Silt w/Fine-Medium Sand (~ 10% Sand)	MH	Dark Gray (7.5YR 4/2)
2	186 - 216"						15.5 - 18'	Clay w/Medium Plasticity	CL	Grayish Brown (5YR 3/2)
3	216 - 236"						18 - 19.75'	Poorly Graded Silt w/Sand (>15% Fine Sand)	SW	Brownish Gray (5YR 4/1)
										Sample # 31 (18-19.5')
4	236 - 264"						19.75 - 22'	Clay w/Medium Plasticity	CL	Grayish Brown (5YR 3/2)
5	264 - 366"						22 - 30.5'	Clay w/High Plasticity	CH	Grayish Brown (5YR 3/2)
								Refusal @ 396" (33-ft.)		East: 597009.3 North: 687235.9 Core Barrel Advanced: 396" Recovery: 366"

R2-0007522

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-01A-B	20050762		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-01A-B	20050762		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	76.25%	%
DC-01A-B	20050762		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	15.13%	%
DC-01A-B	20050762		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	8.63%	%
DC-01A-B	20050762		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	20.0	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	100.00%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.99%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	99.93%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	93.82%	%
DC-01A-B	20050762		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	51.10%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.034818	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022818	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013324	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009474	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006736	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001379	mm
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	28.28%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	16.16%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	12.12%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	10.10%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	8.08%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	8.08%	%
DC-01A-B	20050762		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	7.07%	%
DC-01A-B	20050762		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-01A-B	20050762		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-01A-B	20050762		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-01A-B	20050762		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-01A-B	20050762		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-01A-B	20050762		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.352	
DC-01A-B	20050762		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	497	ppm
DC-01A-B	20050762		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.05	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
1A-C
Time: 1306

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/9/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 1**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 45"						0 - 45"	Silt w/Fine Sand (<15% Fine Sand)	ML	Medium Bluish Gray (5YR 5/1)
2	45 - 111"						45 - 111"	Elastic Silt w/Fine-Medium Sand (~ 10% Sand)	MH	Medium Bluish Gray (5YR 5/1)
										Sample # 30 (60 - 77")
3	111 - 127"						111 - 127"	Poorly Graded Silt w/Sand (>15% Fine Sand)	SW	Dark Gray (7.5YR 4/2)
								Refusal @ 127"		
										East: 597382.6 North: 687155.0
										Core Barrel Advanced: 144" Recovery: 127"

R2-0007524

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-01A-C	20050763		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	1.12%	%
DC-01A-C	20050763		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	93.76%	%
DC-01A-C	20050763		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	1.04%	%
DC-01A-C	20050763		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	4.08%	%
DC-01A-C	20050763		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	14.7	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.88%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	98.88%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	93.90%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	72.24%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	41.07%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	35.48%	%
DC-01A-C	20050763		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	33.61%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037197	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023526	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013583	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009630	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006810	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003336	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	5.00%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	5.00%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	5.00%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	4.00%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	4.00%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	4.00%	%
DC-01A-C	20050763		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.00%	%
DC-01A-C	20050763		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-01A-C	20050763		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-01A-C	20050763		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-01A-C	20050763		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-01A-C	20050763		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-01A-C	20050763		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.549	
DC-01A-C	20050763		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,136	ppm
DC-01A-C	20050763		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.11	%

<1> Sample did not exhibit plastic qualities due to insufficient sample passing through #40 sieve.

* Location DC-01A-C was sampled on 9 June and 13 June 2005. The analysis was done on the sample from 13 June 2005.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
2A
Time: 0840

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/14/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 2**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 80"						0 - 80"	Silt	ML	Black (5YR 2.5/1)
2	80 -96"						80 - 96"	Peat	OL	Brownish Gray (5YR 4/1)
3	96 - 111"						96 - 111"	Clayey Silt	ML	Reddish Gray (5YR 5/2)
4	111 - 121"						111 - 121"	Poorly Graded Fine - Medium Sand w/Silt (~20% Fines)	SP	Medium Bluish Gray (5B 5/1)
5	121 - 152"						121 - 152"	Very Loose Fine-Medium Sand w/Silt (>15% Fines)	SP	Medium Bluish Gray (5B 5/1) **Sample # 35 (121 - 140")**
6	152 - 203"						152 - 203"	Medium-Coarse Sand w/Gravel (<20% Fine Gravel)	SW/SP	Moderate Yellowish Brown (10YR 5/4)
7	203 - 226"						203 - 226"	Clay w/Medium Plasticity and Silt Lenses	CH	Dark Reddish Brown (10R 3/4)
8	226 - 231"						226 - 231"	Fine - Medium Well Graded Sand/Silt (<15% Fines)	SW	Dark Reddish Brown (10R 3/4)
								Refusal @ 360" (30-ft.)		East: 597693.0 North: 691338.9 Core Barrel Advanced: 360" Recovery: 231"

R2-0007526

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-02A	20050767		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-02A	20050767		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	82.59%	%
DC-02A	20050767		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	9.56%	%
DC-02A	20050767		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	7.86%	%
DC-02A	20050767		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	18.0	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.64%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	97.40%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	88.48%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	64.38%	%
DC-02A	20050767		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	46.03%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035559	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023013	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013324	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009474	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006736	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	20.20%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	12.12%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	11.11%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	9.09%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	7.07%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	7.07%	%
DC-02A	20050767		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	7.07%	%
DC-02A	20050767		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-02A	20050767		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-02A	20050767		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-02A	20050767		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-02A	20050767		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-02A	20050767		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.466	
DC-02A	20050767		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,471	ppm
DC-02A	20050767		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.15	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
2B
Time: 0940

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/14/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 2**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 27"						0-27"	Organic Leaf and Wood Debris w/Silt	OL	Very Dark Gray (7.5YR 3/3)
2	27 - 107"						27 - 107"	Silt w/Low Plasticity	ML	Very Dark Gray (7.5YR 3/3)
										Sample # 33 (80 - 92")
3	107 - 149"						107 - 149"	Silt w/Medium Plasticity	ML	Dark Reddish Brown (5YR 4/2)
4	149 - 154"						149 - 154"	Well Graded Fine Sand	SW	Moderate Reddish Brown (10YR 4/6)
5	154 - 163"						154 - 163"	Clay w/Medium Plasticity	CL	Dark Reddish Brown (10YR 3/4)
6	163 - 186"						163 - 186"	Well Graded Fine Sand	SW	Moderate Reddish Brown (10YR 4/6)
								Refusal @ 312" (26-ft.)		East: 597989.5 North: 691250.8 Core Barrel Advanced: 312" Recovery: 186"

R2-0007528

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-02B	20050768		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-02B	20050768		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-02B	20050768		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	64.62%	%
DC-02B	20050768		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	35.38%	%
DC-02B	20050768		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	60.1	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.98%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.79%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	99.61%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	99.42%	%
DC-02B	20050768		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	98.79%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.027932	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018409	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011175	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008240	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006199	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003180	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001345	mm
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	90.43%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	80.85%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	68.09%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	56.38%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	37.23%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	21.28%	%
DC-02B	20050768		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	15.96%	%
DC-02B	20050768		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	119.12	%
DC-02B	20050768		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	53.82	%
DC-02B	20050768		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	65.30	%
DC-02B	20050768		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	119.67	%
DC-02B	20050768		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	53.82	%
DC-02B	20050768		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.546	
DC-02B	20050768		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	63,705	ppm
DC-02B	20050768		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	6.37	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
2C
Time: 1019

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/14/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 2**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 156"						0-156"	Silt w/Low Plasticity	ML	Very Dark Gray (7.5YR 3/3)
2	156 - 225"						156 - 225"	Silt w/Medium Plasticity	ML	Very Dark Gray (7.5YR 3/3)
3	225 - 232"						225 - 232"	Well Graded Fine - Medium Sand	SW	Moderate Reddish Brown (10YR 4/6)
4	232 - 228"						232 - 228"	Clay w/Medium Plasticity	CL	Dark Reddish Brown (10YR 3/4) **Sample # 34 (232 - 250")**
								Refusal @ 384" (32-ft.)		East: 598074.7 North: 691206.7 Core Barrel Advanced: 384" Recovery: 228"

R2-0007530

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-02C	20050769		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.46%	%
DC-02C	20050769		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-02C	20050769		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	63.92%	%
DC-02C	20050769		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	35.62%	%
DC-02C	20050769		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	21.0	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.82%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.54%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	98.87%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	97.66%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	96.59%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	94.94%	%
DC-02C	20050769		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	93.83%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.026843	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018000	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011308	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008419	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006158	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003133	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001329	mm
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	93.94%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	81.82%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	61.62%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	47.47%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	37.37%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	25.25%	%
DC-02C	20050769		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	19.19%	%
DC-02C	20050769		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	25.59	%
DC-02C	20050769		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	18.37	%
DC-02C	20050769		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	7.22	%
DC-02C	20050769		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	26.33	%
DC-02C	20050769		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	18.37	%
DC-02C	20050769		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.528	
DC-02C	20050769		6/17/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,298	ppm
DC-02C	20050769		6/17/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.13	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
3A
Time: 1238

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/16/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 3**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 111"						0 - 111"	Silt w/High Plasticity	MH	Black (5YR 2.5/1)
2	111 - 173"						111 - 173"	Tight Silt	ML	Very Dark Gray (2.5YR 3/3) Very Strong Chemical Odor
3	173 - 179"						179 - 179"	Poorly Graded Medium Sand/Cobbles (Cobbles ~2-inch dia.)	SP	Dark Reddish Brown (2.5YR 3/3)
4	179 - 192"						179 - 192"	Well Graded Medium Sand	SW	Dark Reddish Brown (2.5YR 3/3)
5	192 - 214"						192 - 214"	Clayey Silt	ML	Dark Reddish Brown (2.5YR 3/3) **Sample # 41 (200-212")**
6	214 - 221"						214 - 221"	Poorly Graded Fine - Medium Sand w/Silt (<20% Fines)	SW	Dark Reddish Brown (2.5YR 3/3)
7	221 - 235"						221 - 235"	Clay	CL	Dark Reddish Brown (2.5YR 3/3)
								Refusal @ 288" (24-ft.)		East: 594819.5 North: 695336.1 Core Barrel Advanced: 288" Recovery: 235"

R2-0007532

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-03A	20050774		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-03A	20050774		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	59.41%	%
DC-03A	20050774		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	30.57%	%
DC-03A	20050774		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	10.02%	%
DC-03A	20050774		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	17.8	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.78%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.45%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	97.94%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	88.31%	%
DC-03A	20050774		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	68.58%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.033062	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022021	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013022	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009316	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006662	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001383	mm
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	43.43%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	27.27%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	19.19%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	15.15%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	11.11%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	7.07%	%
DC-03A	20050774		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	5.05%	%
DC-03A	20050774		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-03A	20050774		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-03A	20050774		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-03A	20050774		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-03A	20050774		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-03A	20050774		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.565	
DC-03A	20050774		6/20/2005	EPA 9060	TOC	TOC	Total Organic Carbon	315	ppm
DC-03A	20050774		6/20/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.03	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
3B
Time: 1205

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/16/2005
JOB NUMBER:	3473007	LOCATION:	Mile 3
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Hazy and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 21"						0 - 21"	Silt w/High Plasticity	MH	Black (5YR 2.5/1)
2	21 - 66"						21 - 66"	Tight Silt	ML	Very Dark Gray (2.5YR 3/3)
3	66 - 79"						66 - 79"	Clayey Silt	ML	Very Dark Gray (2.5YR 3/3) **Sample # 40 (68 - 79")**
4	79 - 87"						79 - 87"	Clay w/Moderate Plasticity	CL	Dark Reddish Brown (2.5YR 3/3)
5	87 - 94"						87 - 94"	Moderately Graded Fine Sand w/Silt (<20% Fines)	SW/SP	Dark Reddish Brown (2.5YR 3/3)
6	94 - 103"						94 - 103"	Well Graded Fine Sand	SW	
								Refusal @ 144" (12-ft.)		East: 594761.3 North: 695575.6 Core Barrel Advanced: 144" Recovery: 103"

R2-0007534

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-03B	20050775		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.97%	%
DC-03B	20050775		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	2.20%	%
DC-03B	20050775		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	65.00%	%
DC-03B	20050775		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	31.83%	%
DC-03B	20050775		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	45.4	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.19%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.03%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	98.55%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	97.05%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	95.65%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	94.36%	%
DC-03B	20050775		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	91.73%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.028850	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.019124	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011568	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008419	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006158	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003152	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001360	mm
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	82.11%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	70.53%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	57.89%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	49.47%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	38.95%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	24.21%	%
DC-03B	20050775		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	11.58%	%
DC-03B	20050775		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	79.33	%
DC-03B	20050775		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	44.49	%
DC-03B	20050775		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	34.85	%
DC-03B	20050775		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	78.56	%
DC-03B	20050775		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	44.49	%
DC-03B	20050775		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.744	
DC-03B	20050775		6/20/2005	EPA 9060	TOC	TOC	Total Organic Carbon	62,380	ppm
DC-03B	20050775		6/20/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	6.24	%

R2-0007535

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
3C
Time: 1127

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/16/2005
JOB NUMBER:	3473007	LOCATION:	Mile 3
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Hazy and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 65"						0 - 65"	Silt w/High Plasticity	MH	Black (5YR 2.5/1)
2	65 - 74"						65 - 74"	Clayey Silt	ML	Dark Reddish Brown (2.5YR 3/3)
3	74 - 79"						74 - 79"	Clayey Sand	SW	Dark Reddish Brown (2.5YR 3/3)
4	79-106"						79-106"	Well Graded Fine Sand	SW	Dark Reddish Brown (2.5YR 3/3)
										Sample # 39 (82 - 96")
5	106-131"						106-131"	Tight Silty Clay	ML	Dark Reddish Brown (2.5YR 3/3)
6	131-164"						131-164"	Moderately Graded Fine Sand w/Silt (<20% Fines)	SW/SP	Dark Reddish Brown **(2.5YR 3/3)**
								Refusal @ 216" (18-ft.)		East: 594763.9 North: 695691.3 Core Barrel Advanced: 216" Recovery: 164"

R2-0007536

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-03C	20050776		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-03C	20050776		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	89.33%	%
DC-03C	20050776		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	8.75%	%
DC-03C	20050776		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	1.93%	%
DC-03C	20050776		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	19.5	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.98%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.91%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	99.60%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	93.93%	%
DC-03C	20050776		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	39.69%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036182	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023462	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013583	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009630	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006810	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003354	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001397	mm
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	14.00%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	5.00%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	4.00%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	3.00%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	3.00%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	1.00%	%
DC-03C	20050776		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	1.00%	%
DC-03C	20050776		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-03C	20050776		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-03C	20050776		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-03C	20050776		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-03C	20050776		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-03C	20050776		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.525	
DC-03C	20050776		6/21/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,557	ppm
DC-03C	20050776		6/21/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.16	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
4A
Time: 1525

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/16/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 4**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 87"						0 - 87"	Silt	ML	Black (5YR 2.5/1)
2	87 - 129"						87" - 129"	Silt w/Medium Plasticity and Peat	ML	Black (5YR 2.5/1)
3	129 - 164"						129 - 164"	Silt	ML	Very Dark Gray (5YR 3/1)
4	164 - 192"						164 - 192"	Clayey Silt w/High Plasticity	ML	Very Dark Gray (5YR 3/1)
5	192 - 197"						192 - 197"	Well Graded Fine Sand	SW	Moderate Red (5R 4/6)
6	197 - 204"						197 - 204"	Silt w/Medium Plasticity	ML	Black (5YR 2.5/1) **Sample #44 (197 - 204")**
7	204 - 227"						204 - 227"	Well Graded Fine Sand	SW	Moderate Red (5R 4/6)
								Refusal @ 234" (19.5-ft.)		East: 592379.8 North: 694964.3 Core Barrel Advanced: 234" Recovery: 227"

R2-0007538

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-04A	20050771		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	3.84%	%
DC-04A	20050771		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	43.20%	%
DC-04A	20050771		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	37.07%	%
DC-04A	20050771		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	15.89%	%
DC-04A	20050771		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	34.4	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	98.77%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	96.16%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	94.31%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	87.91%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	78.53%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	72.13%	%
DC-04A	20050771		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	66.15%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.031915	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.020910	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012397	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008962	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006434	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003227	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001360	mm
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	50.52%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	40.21%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	31.96%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	24.74%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	19.59%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	11.34%	%
DC-04A	20050771		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	7.22%	%
DC-04A	20050771		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	56.19	%
DC-04A	20050771		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	34.97	%
DC-04A	20050771		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	21.22	%
DC-04A	20050771		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	56.49	%
DC-04A	20050771		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	34.97	%
DC-04A	20050771		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.021	
DC-04A	20050771		6/20/2005	EPA 9060	TOC	TOC	Total Organic Carbon	56,361	ppm
DC-04A	20050771		6/20/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	5.64	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
4B
Time: 1405

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/16/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 4**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 31"						0 - 31"	Silt w/Medium Plasticity	ML	Black (5YR 2.5/1) Sheen and Strong Odor
2	31 - 48"						31 - 48"	Poorly Graded Fine - Medium Sand w/Fine Gravel (<15% Fine Gravel)	SP	Brownish Gray (5YR 4/1)
3	48 - 80"						48 - 80"	Poorly Graded Medium - Coarse Sand w/Some Large Cobbles (>3-inch dia.)	SP	Brownish Gray (5YR 4/1) **Sample #43 (48 - 80")**
								Refusal @ 144" (12-ft.)		
										East: 592313.7 North: 695159.0 Core Barrel Advanced: 144" Recovery: 80"

R2-0007540

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-04B	20050772		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	58.18%	%
DC-04B	20050772		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	40.13%	%
DC-04B	20050772		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	0.00%	%
DC-04B	20050772		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	1.69%	%
DC-04B	20050772		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	16.2	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	59.96%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	59.96%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	48.53%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	44.22%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	41.82%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	34.49%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	22.23%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	15.87%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	14.74%	%
DC-04B	20050772		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	14.31%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037097	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023462	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013546	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009578	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006773	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001383	mm
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	1.01%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	1.01%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	1.01%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	1.01%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	1.01%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	1.01%	%
DC-04B	20050772		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	1.01%	%
DC-04B	20050772		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-04B	20050772		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-04B	20050772		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-04B	20050772		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-04B	20050772		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-04B	20050772		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.632	
DC-04B	20050772		6/20/2005	EPA 9060	TOC	TOC	Total Organic Carbon	647	ppm
DC-04B	20050772		6/20/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.06	%

<1> Sample did not exhibit plastic qualities due to the amount of sand and gravel present.

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-04B-Dup	20050772D		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	11.80%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	87.31%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	0.00%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	0.89%	%
DC-04B-Dup	20050772D		N/A	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	N/A	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	88.20%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	69.94%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	44.03%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	32.68%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	30.72%	%
DC-04B-Dup	20050772D		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	29.95%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037097	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023462	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013546	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009578	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006773	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001383	mm
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	1.01%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	1.01%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	1.01%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	1.01%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	1.01%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	1.01%	%
DC-04B-Dup	20050772D		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	1.01%	%
DC-04B-Dup	20050772D		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-04B-Dup	20050772D		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-04B-Dup	20050772D		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-04B-Dup	20050772D		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-04B-Dup	20050772D		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-04B-Dup	20050772D		N/A	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	N/A	
DC-04B-Dup	20050772D		N/A	EPA 9060	TOC	TOC	Total Organic Carbon	N/A	ppm
DC-04B-Dup	20050772D		N/A	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	N/A	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-04B-Trp	20050772T		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	18.52%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	80.39%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	0.54%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	0.55%	%
DC-04B-Trp	20050772T		N/A	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	N/A	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	81.48%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	68.41%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	43.97%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	30.82%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	28.55%	%
DC-04B-Trp	20050772T		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	27.73%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037097	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023462	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013546	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009578	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006773	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001386	mm
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	1.01%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	1.01%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	1.01%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	1.01%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	1.01%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	1.01%	%
DC-04B-Trp	20050772T		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	0.00%	%
DC-04B-Trp	20050772T		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-04B-Trp	20050772T		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-04B-Trp	20050772T		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-04B-Trp	20050772T		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-04B-Trp	20050772T		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-04B-Trp	20050772T		N/A	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	N/A	
DC-04B-Trp	20050772T		N/A	EPA 9060	TOC	TOC	Total Organic Carbon	N/A	ppm
DC-04B-Trp	20050772T		N/A	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	N/A	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
4C
Time: 1317

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/16/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 4**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Hazy and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 28"						0 - 28"	Silt	ML	Black (5YR 2.5/1)
2	28 - 57"						28 - 57"	Silt w/Trace Fine Sand. Medium Plasticity (<10% Fine Sand)	ML	Black (5YR 2.5/1)
3	57 - 74"						57 - 74"	Medium Stiff Clay	CL	Dark Reddish Brown (10R 3/4)
4	74 - 79"						74 - 79"	Gravelly Clay w/Fine - Medium Sand (>15% Fine Gravel and Sand)	CL	Dark Reddish Brown (10R 3/4)
5	79 - 88"						79 - 88"	Clay w/Fine Sand (~15% Fine Sand)	CL	Grayish Brown (5YR 3/2)
6	88 - 126"						88 - 126"	Well Graded Fine Sand w/Clay Nodules	SW/SC	Dark Reddish Brown (10R 3/4) **Sample #42 (96 - 108")**
								Refusal @ 144" (12-ft.)		East: 592272.0 North: 695211.2 Core Barrel Advanced: 144" Recovery: 126"

R2-0007544

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-04C	20050773		7/1/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-04C	20050773		7/1/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	86.27%	%
DC-04C	20050773		7/1/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	10.51%	%
DC-04C	20050773		7/1/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	3.22%	%
DC-04C	20050773		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	17.4	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.82%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.24%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	90.18%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	62.92%	%
DC-04C	20050773		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	44.11%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036079	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023207	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013509	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009578	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006791	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003336	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001397	mm
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	15.15%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	9.09%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	6.06%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	5.05%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	4.04%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	3.03%	%
DC-04C	20050773		6/25/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	1.01%	%
DC-04C	20050773		7/21/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-04C	20050773		7/21/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-04C	20050773		7/21/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-04C	20050773		7/21/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-04C	20050773		7/21/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-04C	20050773		7/21/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.456	
DC-04C	20050773		6/20/2005	EPA 9060	TOC	TOC	Total Organic Carbon	279	ppm
DC-04C	20050773		6/20/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.03	%

<1> Sample did not exhibit plastic qualities due to the amount of fine sand content.

R2-0007545

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
5A
Time: 1147

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/9/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 5**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 3"						0 - 3"	Elastic Silt w/Fine Sand (<15% Fine Sand)	MH	Very Dark Brown/Black (7.5YR 3/2)
2	3 - 10"						3 - 10"	Sandy Silt w/Fine - Medium Gravel (>15% Gravel)	ML	Brownish Gray (5YR 4/1) Inadequate Recovery for Sample Collection
								Refusal @ 36"		
										East: 587308.8 North: 692276.9 Core Barrel Advanced: 36" Recovery: 10"

R2-0007546

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
5B
Time: 1237

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/9/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 5**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 14"						0 - 14"	Poorly Graded Fine - Medium Sand w/Gravel (<20% Fine Gravel	SP	Very Dark Brown/Black (7.5YR 3/2) **Sample # 26 (0-14")**
								Refusal @ 36"		
										East: 587355.2 North: 692375.7 Core Barrel Advanced: 36" Recovery: 14"

R2-0007547

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-05B	20050755		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	11.45%	%
DC-05B	20050755		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	80.77%	%
DC-05B	20050755		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	4.52%	%
DC-05B	20050755		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	3.26%	%
DC-05B	20050755		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	20.5	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	98.02%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	88.55%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	77.09%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	49.37%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	36.09%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	33.21%	%
DC-05B	20050755		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	31.61%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036896	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023462	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013546	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009578	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006773	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003354	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001397	mm
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	8.00%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	6.00%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	6.00%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	6.00%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	6.00%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	2.00%	%
DC-05B	20050755		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	2.00%	%
DC-05B	20050755		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-05B	20050755		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-05B	20050755		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-05B	20050755		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-05B	20050755		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-05B	20050755		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.618	
DC-05B	20050755		6/16/2005	EPA 9060	TOC	TOC	Total Organic Carbon	3,591	ppm
DC-05B	20050755		6/16/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.36	%

<1> Sample did not exhibit plastic qualities due to fine sand and gravel content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
5C
Time: 1457

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 5**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 14"						0 - 14"	Silt w/Fine Sand (<15% Fine Sand)	ML	Very Dark Brown/Black (7.5YR 3/2)
2	14 - 16"						14 - 16"	Silty Fine Sand (>25% Fine Sand)	ML	Very Dark Brown/Black (7.5YR 3/2)
										Sample # 25A (0 - 14")
										Sample # 25B (14 - 16")
								Refusal @ 48"		
										East: 587357.7 North: 692410.0
										Core Barrel Advanced: 48" Recovery: 16"

R2-0007549

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-05C	20050754A		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-05C	20050754A		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	10.80%	%
DC-05C	20050754A		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	56.23%	%
DC-05C	20050754A		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	32.98%	%
DC-05C	20050754A		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	66.4	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.83%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.11%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	96.96%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	94.29%	%
DC-05C	20050754A		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	90.79%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.029235	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.019279	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011568	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008419	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006158	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003143	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001345	mm
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	76.00%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	66.00%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	56.00%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	48.00%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	38.00%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	25.00%	%
DC-05C	20050754A		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	16.00%	%
DC-05C	20050754A		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	93.06	%
DC-05C	20050754A		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	57.53	%
DC-05C	20050754A		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	35.53	%
DC-05C	20050754A		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	90.82	%
DC-05C	20050754A		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	57.53	%
DC-05C	20050754A		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.393	
DC-05C	20050754A		6/15/2005	EPA 9060	TOC	TOC	Total Organic Carbon	72,576	ppm
DC-05C	20050754A		6/15/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	7.26	%

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-05C	20050754B		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-05C	20050754B		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	89.57%	%
DC-05C	20050754B		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	4.59%	%
DC-05C	20050754B		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	5.84%	%
DC-05C	20050754B		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	25.3	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.67%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	96.52%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	73.72%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	51.37%	%
DC-05C	20050754B		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	38.99%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036693	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023335	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013472	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009526	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006773	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	10.00%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	8.00%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	8.00%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	8.00%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	6.00%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.00%	%
DC-05C	20050754B		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.00%	%
DC-05C	20050754B		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-05C	20050754B		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-05C	20050754B		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-05C	20050754B		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-05C	20050754B		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-05C	20050754B		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	I.S.	
DC-05C	20050754B		6/16/2005	EPA 9060	TOC	TOC	Total Organic Carbon	11,078	ppm
DC-05C	20050754B		6/16/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	1.11	%

<1> Sample did not exhibit plastic qualities due to the amount of sand content.
I.S. = Insufficient sample

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
6A
Time: 1153

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/10/2005
JOB NUMBER:	3473007	LOCATION:	Mile 6
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 30"						0 - 30"	Silt	ML	Very Dark Brown/Black (7.5YR 3/2)
2	30 - 89"						30 - 89"	Sandy Lean Clay (~ 20% Fine Sand)	CL	Very Dark Brown/Black (7.5YR 3/2)
3	89 - 91"						89 - 91"	Poorly Graded Silt w/Sand (>15% Fine Sand)	SW	Dark Gray (7.5YR 4/2)
4	91 - 104"						91 - 104"	Sandy Lean Clay (~ 20% Fine Sand)	CL	Dark Gray (7.5YR 4/2) **Sample # 29 (91 - 104")**
								Refusal @ 108"		
										East: 585180.4 North: 694649.6 Core Barrel Advanced: 108" Recovery: 104"

R2-0007552

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-06A	20050756		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	1.83%	%
DC-06A	20050756		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	42.83%	%
DC-06A	20050756		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	38.22%	%
DC-06A	20050756		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	17.12%	%
DC-06A	20050756		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	43.7	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	98.17%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	95.89%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	90.45%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	82.46%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	74.56%	%
DC-06A	20050756		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	66.58%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.032379	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.021193	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012556	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009045	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006511	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003255	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001379	mm
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	51.55%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	41.24%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	32.99%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	26.80%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	20.62%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	13.40%	%
DC-06A	20050756		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	7.22%	%
DC-06A	20050756		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	53.85	%
DC-06A	20050756		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	41.55	%
DC-06A	20050756		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	12.31	%
DC-06A	20050756		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	54.28	%
DC-06A	20050756		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	41.55	%
DC-06A	20050756		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.767	
DC-06A	20050756		6/16/2005	EPA 9060	TOC	TOC	Total Organic Carbon	104,605	ppm
DC-06A	20050756		6/16/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	10.46	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
6B
Time: 1127

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/10/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 6**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 17"						0 - 17"	Silt w/Organic Material	ML	Very Dark Brown/Black (7.5YR 3/2)
2	17 - 44"						17 - 44"	Elastic Silt w/Fine Sand and Organic Material (<15% Fine Sand) (<10% Organic Material)	MH	Very Dark Brown/Black (7.5YR 3/2)
										Sample # 28 (24 - 40")
								Refusal @ 65"		
										East: 585328.2 North: 694655.3
										Core Barrel Advanced: 65" Recovery: 44"

R2-0007554

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-06B	20050757		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-06B	20050757		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	7.49%	%
DC-06B	20050757		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	60.53%	%
DC-06B	20050757		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	31.98%	%
DC-06B	20050757		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	58.4	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.78%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.30%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	98.33%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	95.33%	%
DC-06B	20050757		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	91.62%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.029489	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.019433	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011611	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008478	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006199	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003171	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001356	mm
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	77.89%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	67.37%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	57.89%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	48.42%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	37.89%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	23.16%	%
DC-06B	20050757		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	13.68%	%
DC-06B	20050757		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	94.07	%
DC-06B	20050757		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	57.00	%
DC-06B	20050757		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	37.07	%
DC-06B	20050757		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	94.30	%
DC-06B	20050757		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	57.00	%
DC-06B	20050757		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.548	
DC-06B	20050757		6/16/2005	EPA 9060	TOC	TOC	Total Organic Carbon	84,881	ppm
DC-06B	20050757		6/16/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	8.49	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
6C
Time: 1034

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/10/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 6**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 20"						0 - 20"	Silt	ML	Very Dark Brown/Black (7.5YR 3/2)
2	20 - 29"						20 - 29"	Elastic Silt w/Fine Sand (<15% Fine Sand)	MH	Very Dark Brown/Black (7.5YR 3/2)
3	29 - 33"						29 - 33"	Silt	ML	Very Dark Brown/Black (7.5YR 3/2)
4	33 - 40"						33 - 40"	Elastic Silt w/Fine Sand (<15% Fine Sand)	MH	Very Dark Brown/Black (7.5YR 3/2)
5	40 - 53"						40 - 53"	Poorly Graded Fine-Medium Sand w/Gravel (<15% Fine Gravel)	SP	Medium Bluish Gray (5B 5/1) **Sample # 27 (40 - 53")**
								Refusal @ 72"		
										East: 585457.2 North: 694735.5 Core Barrel Advanced: 72" Recovery: 53"

R2-0007556

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-06C	20050758		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	41.83%	%
DC-06C	20050758		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	50.41%	%
DC-06C	20050758		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	4.34%	%
DC-06C	20050758		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	3.42%	%
DC-06C	20050758		6/24/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	15.8	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	93.06%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	86.93%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	58.17%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	49.09%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	38.05%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	29.55%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	25.82%	%
DC-06C	20050758		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	23.83%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036285	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023207	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013472	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009526	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006773	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	14.00%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	10.00%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	8.00%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	8.00%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	6.00%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.00%	%
DC-06C	20050758		6/22/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.00%	%
DC-06C	20050758		7/20/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-06C	20050758		7/20/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-06C	20050758		7/20/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-06C	20050758		7/20/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-06C	20050758		7/20/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-06C	20050758		7/20/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.767	
DC-06C	20050758		6/16/2005	EPA 9060	TOC	TOC	Total Organic Carbon	13,947	ppm
DC-06C	20050758		6/16/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	1.39	%

<1> Sample did not exhibit plastic qualities due to the amount of sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
7A
Time: 1340

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 7**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0 - 80"						0 - 80"	Elastic Silt w/Trace Fine Sand Gravel Lens @ 76 - 78" (<10% Fine Sand)	MH	Very Dark Brown/Black (7.5YR 3/2) **Sample # 24 (60 - 80")**
								Refusal @ 96"		
										East: 586064.3 North: 703141.8 Core Barrel Advanced: 96" Recovery: 80"

R2-0007558

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-07A	20050750		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	45.15%	%
DC-07A	20050750		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	15.38%	%
DC-07A	20050750		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	25.89%	%
DC-07A	20050750		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	13.57%	%
DC-07A	20050750		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	43.9	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	89.93%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	85.50%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	74.38%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	54.85%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	53.22%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	49.42%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	46.76%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	44.48%	%
DC-07A	20050750		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	41.31%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.030967	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.020185	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012154	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008709	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006278	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003319	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001360	mm
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	62.50%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	54.17%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	41.67%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	37.50%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	31.25%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	18.75%	%
DC-07A	20050750		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	10.42%	%
DC-07A	20050750		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	80.23	%
DC-07A	20050750		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	45.87	%
DC-07A	20050750		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	34.36	%
DC-07A	20050750		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	80.72	%
DC-07A	20050750		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	45.87	%
DC-07A	20050750		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.932	
DC-07A	20050750		6/14/2005	EPA 9060	TOC	TOC	Total Organic Carbon	67,130	ppm
DC-07A	20050750		6/14/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	6.71	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
7B
Time: 1315

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 7**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
No.	Depth	Rec	Blows per 6"				
1	0 - 12"			0 - 12"	Silty Fine Sand w/ Organic Leaf Debris (<25% Fine Sand)	ML	Very Dark Brown/Black (7.5YR 3/2)
2	12 - 25"			12 - 25"	Silty Fine Sand (>25% Fine Sand)	ML	Very Dark Brown/Black (7.5YR 3/2) **Sample # 23 (12 - 25")**
					Refusal @ 84"		
							East: 586172.0 North: 703075.6 Core Barrel Advanced: 84" Recovery: 25"

R2-0007560

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-07B	20050751		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	23.38%	%
DC-07B	20050751		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	62.46%	%
DC-07B	20050751		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	8.20%	%
DC-07B	20050751		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	5.96%	%
DC-07B	20050751		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	28.1	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	90.48%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	88.98%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	86.53%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	76.62%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	75.48%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	73.50%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	69.30%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	51.88%	%
DC-07B	20050751		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	33.10%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036079	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022948	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013324	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009422	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006699	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	16.33%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	14.29%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	12.24%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	12.24%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	10.20%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.12%	%
DC-07B	20050751		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.08%	%
DC-07B	20050751		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-07B	20050751		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-07B	20050751		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-07B	20050751		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-07B	20050751		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-07B	20050751		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.152	
DC-07B	20050751		6/15/2005	EPA 9060	TOC	TOC	Total Organic Carbon	33,138	ppm
DC-07B	20050751		6/15/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	3.31	%

<1> Sample did not exhibit plastic qualities due to the amount of sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
7C
Time: 1245

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 7**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 14"						0 - 14"	Silt	ML	Brownish Gray (5YR 4/1)
2	14 - 32"						14 - 32"	Organic Leaf Material/Soil w/Fine Sand and Silt	OL/OH	Brownish Gray (5YR 4/1) **Sample # 22 (14 - 32")**
3	32 - 40"						32 - 40"	Poorly Graded Sand w/Silt (>25% Fines)	SP/SM	Dark Reddish Gray (10R 3/1)
								Refusal @ 84"		
										East: 586238.9 North: 703033.3 Core Barrel Advanced: 84" Recovery: 40"

R2-0007562

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-07C	20050752		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	18.88%	%
DC-07C	20050752		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	44.92%	%
DC-07C	20050752		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	22.45%	%
DC-07C	20050752		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	13.75%	%
DC-07C	20050752		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	54.6	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	97.78%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	81.12%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	78.94%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	71.04%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	64.60%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	56.86%	%
DC-07C	20050752		6/30/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	49.47%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.033509	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.021748	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012792	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009100	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006549	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003264	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001367	mm
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	42.11%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	33.68%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	27.37%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	25.26%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	18.95%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	12.63%	%
DC-07C	20050752		6/16/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	10.53%	%
DC-07C	20050752		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	61.38	%
DC-07C	20050752		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	58.70	%
DC-07C	20050752		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	2.68	%
DC-07C	20050752		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	70.06	%
DC-07C	20050752		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	58.70	%
DC-07C	20050752		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.527	
DC-07C	20050752		6/15/2005	EPA 9060	TOC	TOC	Total Organic Carbon	81,691	ppm
DC-07C	20050752		6/15/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	8.17	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
8A
Time: 1050

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 8**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-9"						0-9"	Poorly Graded Sand w/Silt (>15% Fines)	SM	Grayish Brown (5YR 3/2) **Sample # 19 (0-9")**
2	9-27"						9-27"	Silt w/Fine Sand (<15% Sand)	ML	Very Dark Gray (5YR 3/1)
3	27-32"						27-32"	Poorly Graded Sand w/Silt (>15% Fines)	SM	Grayish Brown (5YR 3/2)
								Refusal @ 60"		
										East: 587757.7 North: 706734.1 Core Barrel Advanced: 60" Recovery: 32"

R2-0007564

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-08A	20050747		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	7.43%	%
DC-08A	20050747		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	44.51%	%
DC-08A	20050747		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	32.37%	%
DC-08A	20050747		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	15.69%	%
DC-08A	20050747		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	36.3	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	98.74%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	92.57%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	90.13%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	83.44%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	75.17%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	70.90%	%
DC-08A	20050747		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	64.19%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.032836	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.021333	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012635	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009100	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006511	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003264	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	47.42%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	39.18%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	30.93%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	24.74%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	20.62%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	12.37%	%
DC-08A	20050747		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	8.25%	%
DC-08A	20050747		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	47.14	%
DC-08A	20050747		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	34.19	%
DC-08A	20050747		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	12.95	%
DC-08A	20050747		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	46.54	%
DC-08A	20050747		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	34.19	%
DC-08A	20050747		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.036	
DC-08A	20050747		6/14/2005	EPA 9060	TOC	TOC	Total Organic Carbon	50,729	ppm
DC-08A	20050747		6/14/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	5.07	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
8B
Time: 1120

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 8**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	**Depth**	**Rec**	**Blows per 6"**				**Depth**	**SOIL DESCRIPTION**	**USCS Lithology**	**REMARKS**
1	0 - 12"						0 - 12"	Silty Gravel w/Fine - Medium Sand (>15% Fines)	GM	Grayish Brown (5YR 3/2) **Sample # 20 (0-12")**
								Refusal @ 48"		
										East: 587861.3 North: 706664.9 Core Barrel Advanced: 48" Recovery: 12"

R2-0007566

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-08B	20050748		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	10.79%	%
DC-08B	20050748		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	79.52%	%
DC-08B	20050748		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	6.53%	%
DC-08B	20050748		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	3.15%	%
DC-08B	20050748		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	21.2	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	97.72%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	96.12%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	89.21%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	86.86%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	72.76%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	48.73%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	37.08%	%
DC-08B	20050748		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	32.39%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.032148	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.021193	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012556	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008990	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006473	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003245	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001367	mm
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	53.61%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	41.24%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	32.99%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	28.87%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	22.68%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	14.43%	%
DC-08B	20050748		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	10.31%	%
DC-08B	20050748		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-08B	20050748		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-08B	20050748		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-08B	20050748		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-08B	20050748		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-08B	20050748		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.390	
DC-08B	20050748		6/14/2005	EPA 9060	TOC	TOC	Total Organic Carbon	9,731	ppm
DC-08B	20050748		6/14/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.973	%

<1> Sample did not exhibit plastic qualities due to amount of sand present.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
8C
Time: 1210

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/8/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 8**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0 - 14"						0 - 14"	Silt	ML	Black (7.5YR 2/0)
2	14 - 17"						14 - 17"	Poorly Graded Medium - Coarse Sand w/Gravel (<5% Fines)	SP	Dark Reddish Brown (10YR 3/4)
3	17 - 29"						17 - 29"	Well Graded Fine Sand (<10% Fines)	SW	Grayish Brown (5YR 3/2) **Sample #21 (17 - 29")**
4	29 - 32"						29 - 32"	Poorly graded gravel w/Fine-Medium Sand (<15% Sand)	GP	Dark Reddish Brown (10YR 3/4)
								Refusal @ 72"		
										East: 588025.5 North: 706604.2 Core Barrel Advanced: 72" Recovery: 32"

R2-0007568

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-08C	20050749		6/30/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	5.78%	%
DC-08C	20050749		6/30/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	82.31%	%
DC-08C	20050749		6/30/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	6.74%	%
DC-08C	20050749		6/30/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	5.17%	%
DC-08C	20050749		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	25.3	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	98.30%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	94.22%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	92.86%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	88.54%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	62.26%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	43.79%	%
DC-08C	20050749		7/1/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	36.97%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036285	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023078	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013398	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009474	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006736	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001383	mm
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	12.12%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	10.10%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	8.08%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	8.08%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	6.06%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	4.04%	%
DC-08C	20050749		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.04%	%
DC-08C	20050749		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-08C	20050749		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-08C	20050749		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-08C	20050749		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-08C	20050749		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-08C	20050749		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.338	
DC-08C	20050749		6/14/2005	EPA 9060	TOC	TOC	Total Organic Carbon	8,703	ppm
DC-08C	20050749		6/14/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.87	%

<1> Sample did not exhibit plastic qualities due to amount of sand present.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING: **9A**
Time: 0835

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/8/2005
JOB NUMBER:	3473007	LOCATION:	Mile 9
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
								No Recovery After 3 Attempts		East: 589362.8 North: 710721.7 Core Barrel Advanced: 0 Recovery: 0

R2-0007570

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
9B
Time: 0920

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/8/2005
JOB NUMBER:	3473007	LOCATION:	Mile 9
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
								No Recovery After 3 Attempts		East: 589459.1 North: 710725.3 Core Barrel Advanced: 0 Recovery: 0

R2-0007571

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING: **9C**
Time: 1018

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/8/2005
JOB NUMBER:	3473007	LOCATION:	Mile 9
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-16"						0-16"	Poorly Graded Sand w/Silt (>15% Fines)	SM	Very Dark Gray (5YR 3/1)
										Sample # 18 (0-16")
								Refusal @ 84"		
										East: 589571.3 North: 710717.5
										Core Barrel Advanced: 84" Recovery: 16"

R2-0007572

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-09C	20050746		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	2.41%	%
DC-09C	20050746		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	72.55%	%
DC-09C	20050746		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	16.91%	%
DC-09C	20050746		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	8.13%	%
DC-09C	20050746		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	39.3	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	98.95%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	97.59%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	96.56%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	93.45%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	84.57%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	61.13%	%
DC-09C	20050746		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	46.76%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035031	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022556	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013099	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009369	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006662	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001383	mm
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	24.49%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	18.37%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	16.33%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	12.24%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	10.20%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.12%	%
DC-09C	20050746		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.08%	%
DC-09C	20050746		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-09C	20050746		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-09C	20050746		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-09C	20050746		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-09C	20050746		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-09C	20050746		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.011	
DC-09C	20050746		6/14/2005	EPA 9060	TOC	TOC	Total Organic Carbon	20,075	ppm
DC-09C	20050746		6/14/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	2.01	%

<1> Sample did not exhibit plastic qualities due to amount of sand present.

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.23%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	75.08%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	15.63%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	9.06%	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	N/A	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.77%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	98.80%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	95.56%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	86.86%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	63.13%	%
DC-09C-Dup	20050746-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	46.70%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035031	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022556	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013174	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009316	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006662	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	24.49%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	18.37%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	14.29%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	14.29%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	10.20%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.12%	%
DC-09C-Dup	20050746-Dup		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	6.12%	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	N/A	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	N/A	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD4318	Atterberg Limits	PI	Plasticity Index	N/A	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	N/A	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	N/A	%
DC-09C-Dup	20050746-Dup		N/A	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	N/A	
DC-09C-Dup	20050746-Dup		N/A	EPA 9060	TOC	TOC	Total Organic Carbon	N/A	ppm
DC-09C-Dup	20050746-Dup		N/A	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	N/A	%

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.89%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	73.66%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	16.19%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	9.26%	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	N/A	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.11%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	98.36%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	95.25%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	86.19%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	62.37%	%
DC-09C-Trp	20050746-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	47.85%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035031	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022423	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013174	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009316	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006643	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	24.49%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	20.41%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	14.29%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	14.29%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	11.22%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.12%	%
DC-09C-Trp	20050746-Trp		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	6.12%	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	N/A	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	N/A	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD4318	Atterberg Limits	PI	Plasticity Index	N/A	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	N/A	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	N/A	%
DC-09C-Trp	20050746-Trp		N/A	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	N/A	
DC-09C-Trp	20050746-Trp		N/A	EPA 9060	TOC	TOC	Total Organic Carbon	N/A	ppm
DC-09C-Trp	20050746-Trp		N/A	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	N/A	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
10A
Time: 1115

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/7/2005
JOB NUMBER:	3473007	LOCATION:	Mile 10
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-28"						0-28"	Fine-Medium Silty Sand	SM	Medium Bluish Gray (5B 5/1) **Sample #16 (15-25")**
								Refusal @ 84"		
										East: 591570.2 North: 714966.6 Core Barrel Advanced: 84" Recovery: 28"

R2-0007576

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-10A	20050744		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-10A	20050744		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	43.23%	%
DC-10A	20050744		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	37.39%	%
DC-10A	20050744		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	19.38%	%
DC-10A	20050744		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	44.6	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.92%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.46%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	97.66%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	87.93%	%
DC-10A	20050744		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	71.93%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.032148	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.021193	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012556	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008990	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006473	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003245	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001367	mm
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	53.61%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	41.24%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	32.99%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	28.87%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	22.68%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	14.43%	%
DC-10A	20050744		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	10.31%	%
DC-10A	20050744		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	54.49	%
DC-10A	20050744		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	38.84	%
DC-10A	20050744		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	15.66	%
DC-10A	20050744		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	56.22	%
DC-10A	20050744		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	38.84	%
DC-10A	20050744		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.790	
DC-10A	20050744		6/13/2005	EPA 9060	TOC	TOC	Total Organic Carbon	49,962	ppm
DC-10A	20050744		6/13/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	5.00	%

R2-0007577

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
10B
Time: 1140

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/7/2005
JOB NUMBER:	3473007	LOCATION:	Mile 10
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-7"						0-7"	Fine-Medium Silty Sand	SM	Medium Bluish Gray (5B 5/1)
2	7-15"						7-15"	Fine-Medium Silty Sand	SM	Dark Reddish Brown (10YR 3/4)
3	15-24"						15-24"	Well Graded Fine Sand	SW	Dark Reddish Brown (10YR 3/4)
										Sample #17 (15-24")
								Refusal @ 48"		
										East: 591658.0 North: 714933.4 Core Barrel Advanced: 48" Recovery: 24"

R2-0007578

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-10B	20050745		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.83%	%
DC-10B	20050745		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	93.47%	%
DC-10B	20050745		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	3.22%	%
DC-10B	20050745		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	2.47%	%
DC-10B	20050745		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	22.3	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.59%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.17%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	98.44%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	83.61%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	41.25%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	33.47%	%
DC-10B	20050745		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	30.95%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037097	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023589	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013619	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009630	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006846	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003354	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001397	mm
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	6.00%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	4.00%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	4.00%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	4.00%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	2.00%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	2.00%	%
DC-10B	20050745		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	2.00%	%
DC-10B	20050745		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-10B	20050745		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-10B	20050745		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-10B	20050745		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-10B	20050745		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-10B	20050745		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.730	
DC-10B	20050745		6/13/2005	EPA 9060	TOC	TOC	Total Organic Carbon	375	ppm
DC-10B	20050745		6/13/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.04	%

<1> Sample did not exhibit plastic qualities due to the amount of sand content.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
10C
Time: 1220

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/7/2005
JOB NUMBER:	3473007	LOCATION:	Mile 10
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-3"						0-3"	Poorly Graded w/Silt and Gravel	SP	Medium Bluish Gray (5B 5/1)
										No sample collection due to inadequate revovery volume
								Refusal @ 24"		
										East: 591722.7 North: 714910.8
										Core Barrel Advanced: 24" Recovery: 3"

R2-0007580

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
11A
Time: 1030

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/7/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 11**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									
No.	Depth	Rec	Blows per 6"	Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-8"			0-8"	Fine-Medium Silty Sand	SM	Medium Bluish Gray (5B 5/1)
2	8-16"			8-16"	Elastic Silt (<15% Fine Sand)	MH	Dark Reddish Brown (10YR 3/4) **Sample #15 (8-16")**
					Refusal @ 36"		
							East: 592072.8 North: 719586.0 Core Barrel Advanced: 36" Recovery: 16"

R2-0007581

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-11A	20050741		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	5.58%	%
DC-11A	20050741		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-11A	20050741		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	53.35%	%
DC-11A	20050741		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	41.08%	%
DC-11A	20050741		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	25.0	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	97.09%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	94.42%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	92.96%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	91.10%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	90.00%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	89.31%	%
DC-11A	20050741		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	88.51%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.027393	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018328	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011041	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008119	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.005912	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003066	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001321	mm
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	91.84%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	79.59%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	69.39%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	59.18%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	51.02%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	33.67%	%
DC-11A	20050741		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	22.45%	%
DC-11A	20050741		7/14/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	29.09	%
DC-11A	20050741		7/14/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	18.18	%
DC-11A	20050741		7/14/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	10.91	%
DC-11A	20050741		7/14/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	30.43	%
DC-11A	20050741		7/14/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	18.18	%
DC-11A	20050741		7/14/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.435	
DC-11A	20050741		6/9/2005	EPA 9060	TOC	TOC	Total Organic Carbon	842	ppm
DC-11A	20050741		6/9/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.08	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
11B
Time: 0950

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/7/2005
JOB NUMBER:	3473007	LOCATION:	Mile 11
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-12"						0-12"	Poorly Graded Gravel w/Silt and Sand (<15% Fines)	GP-GM	Grayish Brown (5YR 3/2) **Sample #13 (0-12")**
2	12-30"						12-30"	Elastic Silt (<15% Fine Sand)	MH	Dark Reddish Brown (10YR 3/4) **Sample #14 (18-30")**
								Refusal @ 48"		
										East: 592155.5 North: 719580.9 Core Barrel Advanced: 48" Recovery: 30"

R2-0007583

Sample 13

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-11B	20050742		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	9.56%	%
DC-11B	20050742		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	74.95%	%
DC-11B	20050742		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	9.08%	%
DC-11B	20050742		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	6.41%	%
DC-11B	20050742		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	28.9	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	98.16%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	97.00%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	90.44%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	84.32%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	73.99%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	57.06%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	42.39%	%
DC-11B	20050742		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	38.11%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036079	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023078	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013324	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009474	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006736	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	16.33%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	12.24%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	12.24%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	10.20%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	8.16%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.12%	%
DC-11B	20050742		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.08%	%
DC-11B	20050742		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-11B	20050742		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-11B	20050742		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-11B	20050742		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-11B	20050742		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-11B	20050742		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.131	
DC-11B	20050742		6/9/2005	EPA 9060	TOC	TOC	Total Organic Carbon	33899.3	ppm
DC-11B	20050742		6/9/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	3.39	%

<1> Sample did not exhibit plastic qualities due to the sand/gravel content.

Sample 14

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-11B-2	20050743		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.30%	%
DC-11B-2	20050743		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	0.00%	%
DC-11B-2	20050743		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	67.29%	%
DC-11B-2	20050743		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	32.41%	%
DC-11B-2	20050743		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	23.6	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.70%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.37%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	98.63%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	97.64%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	96.95%	%
DC-11B-2	20050743		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	96.50%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.026843	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.018000	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.011308	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008419	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006239	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003190	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001356	mm
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	95.92%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	83.67%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	63.27%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	48.98%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	34.69%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	20.41%	%
DC-11B-2	20050743		6/15/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	13.27%	%
DC-11B-2	20050743		7/15/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	26.09	%
DC-11B-2	20050743		7/15/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	18.39	%
DC-11B-2	20050743		7/15/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	7.70	%
DC-11B-2	20050743		7/15/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	27.00	%
DC-11B-2	20050743		7/15/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	18.39	%
DC-11B-2	20050743		7/15/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.472	
DC-11B-2	20050743		6/9/2005	EPA 9060	TOC	TOC	Total Organic Carbon	996.1	ppm
DC-11B-2	20050743		6/9/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.10	%

Sample 13

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	4.57%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	78.69%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	9.94%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	6.80%	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	N/A	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	95.43%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	90.37%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	79.85%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	60.86%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	45.34%	%
DC-11B-1-Dup	20050742-Dup		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	40.58%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036079	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023013	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013324	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009474	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006736	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003318	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	16.33%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	13.27%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	12.24%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	10.20%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	8.16%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.12%	%
DC-11B-1-Dup	20050742-Dup		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.08%	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	N/A	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	N/A	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD4318	Atterberg Limits	PI	Plasticity Index	N/A	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	N/A	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	N/A	%
DC-11B-1-Dup	20050742-Dup		N/A	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	N/A	
DC-11B-1-Dup	20050742-Dup		N/A	EPA 9060	TOC	TOC	Total Organic Carbon	N/A	ppm
DC-11B-1-Dup	20050742-Dup		N/A	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	N/A	%

Sample 13

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	6.15%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	75.84%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	10.38%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	7.62%	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	N/A	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	93.85%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	88.68%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	78.31%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	59.54%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	44.78%	%
DC-11B-1-Trp	20050742-Trp		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	40.39%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035975	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022948	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013287	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009422	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006699	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003309	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	17.35%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	14.29%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	13.27%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	12.24%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	10.20%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	7.14%	%
DC-11B-1-Trp	20050742-Trp		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	4.08%	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	N/A	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	N/A	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD4318	Atterberg Limits	PI	Plasticity Index	N/A	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	N/A	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	N/A	%
DC-11B-1-Trp	20050742-Trp		N/A	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	N/A	
DC-11B-1-Trp	20050742-Trp		N/A	EPA 9060	TOC	TOC	Total Organic Carbon	N/A	ppm
DC-11B-1-Trp	20050742-Trp		N/A	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	N/A	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
11C
Time: 0855

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/7/2005
JOB NUMBER:	3473007	LOCATION:	Mile 11
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
								No Recovery After 3 Attempts		East: 592202.6 North: 719571.5 Core Barrel Advanced: 0 Recovery: 0

R2-0007588

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
12A
Time: 1455

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/6/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 12**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-15"						0-15"	Silt	ML	Brownish Gray (5YR 4/1)
										Sample#12 (0-15")
2	15-18"						15-18"	Silty Medium Sand (<25% Fines)	SM	Brownish Gray (5YR 4/1)
								Refusal @ 24"		
										East: 595099.1 North: 724015.8 Core Barrel Advanced: 24" Recovery: 18"

R2-0007589

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-12A	20050740		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.97%	%
DC-12A	20050740		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	28.76%	%
DC-12A	20050740		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	44.44%	%
DC-12A	20050740		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	25.83%	%
DC-12A	20050740		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	61.7	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.21%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.03%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	98.30%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	95.57%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	85.00%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	77.26%	%
DC-12A	20050740		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	71.95%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.031445	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.020478	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012072	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008738	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006318	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003208	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001360	mm
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	61.05%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	52.63%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	46.32%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	38.95%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	31.58%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	18.95%	%
DC-12A	20050740		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	12.63%	%
DC-12A	20050740		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	97.22	%
DC-12A	20050740		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	60.29	%
DC-12A	20050740		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	36.93	%
DC-12A	20050740		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	97.97	%
DC-12A	20050740		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	60.29	%
DC-12A	20050740		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.498	
DC-12A	20050740		6/9/2005	EPA 9060	TOC	TOC	Total Organic Carbon	55,126	ppm
DC-12A	20050740		6/9/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	5.51	%

R2-0007590

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
12B
Time: 1415

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 12
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
								No Recovery After 3 Attampts		
										East: 595151.6 North: 723939.5 Core Barrel Advanced: 0 Recovery:

R2-0007591

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
12C
Time: 1322

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 12
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-15"						0-15"	Silt	ML	Brownish Gray (5YR 4/1)
										Sanple#10 (0-15")
2	15-18"						15-18"	Silty Sand w/Gravel	SM	Brownish Gray (5YR 4/1)
								Refusal @ 48"		
										East: 595168.6 North: 723902.5
										Core Barrel Advanced: 48" Recovery: 18"

R2-0007592

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-12C	20050734		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.51%	%
DC-12C	20050734		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	30.92%	%
DC-12C	20050734		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	43.76%	%
DC-12C	20050734		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	24.81%	%
DC-12C	20050734		6/29/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	50.0	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.49%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.49%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.28%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	93.01%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	84.01%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	79.85%	%
DC-12C	20050734		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	76.33%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.031445	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.020405	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012154	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008823	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006396	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003218	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001364	mm
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	62.50%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	55.21%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	45.83%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	37.50%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	29.17%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	19.79%	%
DC-12C	20050734		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	13.54%	%
DC-12C	20050734		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	68.06	%
DC-12C	20050734		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	46.10	%
DC-12C	20050734		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	21.96	%
DC-12C	20050734		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	67.69	%
DC-12C	20050734		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	46.10	%
DC-12C	20050734		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.711	
DC-12C	20050734		6/8/2005	EPA 9060	TOC	TOC	Total Organic Carbon	148,776	ppm
DC-12C	20050734		6/8/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	14.88	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
13A
Time: 1247

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 13
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-20"						0-20"	Silt	ML	Grayish Olive (10YR 4/2)
										Sanple#9 (12-20")
2	20-22"						20-22"	Silty Sand w/Gravel	SM	Grayish Olive (10YR 4/2)
								Refusal @ 48"		
										East: 596908.4 North: 727557.6 Core Barrel Advanced: 48" Recovery: 22"

R2-0007594

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-13A	20050735		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.15%	%
DC-13A	20050735		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	27.46%	%
DC-13A	20050735		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	44.96%	%
DC-13A	20050735		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	27.43%	%
DC-13A	20050735		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	58.5	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	99.85%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.70%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	98.71%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	96.65%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	87.89%	%
DC-13A	20050735		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	75.33%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.030967	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.020478	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012072	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.008709	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006318	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003190	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001352	mm
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	65.26%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	52.63%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	46.32%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	40.00%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	31.58%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	21.05%	%
DC-13A	20050735		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	14.74%	%
DC-13A	20050735		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	77.23	%
DC-13A	20050735		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	49.24	%
DC-13A	20050735		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	27.99	%
DC-13A	20050735		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	77.50	%
DC-13A	20050735		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	49.24	%
DC-13A	20050735		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.567	
DC-13A	20050735		6/8/2005	EPA 9060	TOC	TOC	Total Organic Carbon	67,493	ppm
DC-13A	20050735		6/8/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	6.75	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
13B
Time: 1210

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/6/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 13**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-5"						0-5"	Silty Sand w/Gravel	SM	Grayish Olive (10YR 4/2)
										Inadequate recovery for sample collection. Three attempts made at recovery.
								Refusal @ 30"		
										East: 596971.4 North: 727527.3
										Core Barrel Advanced: 30" Recovery: 5"

R2-0007596

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
13C
Time: 1130

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 13
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-14"						0-14"	Poorly Graded Gravel w/Silt and Sand (>15% Fines)	GM	Grayish Olive (10YR 4/2) **Sample #8 (0-14")**
								Refusal @ 24"		
										East: 597018.1 North: 727526.7 Core Barrel Advanced: 24" Recovery: 14"

R2-0007597

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-13C	20050736		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	41.24%	%
DC-13C	20050736		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	59.48%	%
DC-13C	20050736		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	11.07%	%
DC-13C	20050736		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	6.10%	%
DC-13C	20050736		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	11.6	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	96.86%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	88.85%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	81.01%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	71.33%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	58.76%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	54.89%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	48.58%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	41.12%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	35.68%	%
DC-13C	20050736		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	31.18%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.034387	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022556	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013174	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009369	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006699	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003300	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	32.32%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	20.20%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	16.16%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	14.14%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	10.10%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	8.08%	%
DC-13C	20050736		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	8.08%	%
DC-13C	20050736		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-13C	20050736		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-13C	20050736		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-13C	20050736		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-13C	20050736		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-13C	20050736		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.966	
DC-13C	20050736		6/8/2005	EPA 9060	TOC	TOC	Total Organic Carbon	5,435	ppm
DC-13C	20050736		6/8/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.54	%

<1> Sample did not exhibit plastic qualities due to fine sand content passing #40 sieve.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
14A
Time: 1055

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 14
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-18"						0-18"	Silty Sand	SM	Grayish Olive (10YR 4/2)
										Sample #7 (0-18")
2	18-22"						18-22"	Poorly Graded Sand w/Gravel	SP	Grayish Olive (10YR 4/2)
								Refusal @ 48"		
										East: 597129.7 North: 734400.6
										Core Barrel Advanced: 48" Recovery: 22"

R2-0007599

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-14A	20050737		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	3.63%	%
DC-14A	20050737		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	70.41%	%
DC-14A	20050737		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	14.70%	%
DC-14A	20050737		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	11.26%	%
DC-14A	20050737		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	38.7	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.61%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	96.37%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	94.12%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	87.32%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	66.44%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	49.66%	%
DC-14A	20050737		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	46.06%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.035031	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022556	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013136	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009342	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006625	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003291	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	26.53%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	20.41%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	17.35%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	15.31%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	14.29%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	9.18%	%
DC-14A	20050737		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	8.16%	%
DC-14A	20050737		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-14A	20050737		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-14A	20050737		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-14A	20050737		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-14A	20050737		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-14A	20050737		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.991	
DC-14A	20050737		6/8/2005	EPA 9060	TOC	TOC	Total Organic Carbon	61,061	ppm
DC-14A	20050737		6/8/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	6.11	%

<1> Sample did not exhibit plastic qualities due to fine sand content passing #40 sieve.

R2-0007600

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
14B
Time: 1040

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 14
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-38"						0-38"	Silty Fine Sand	SM	Grayish Olive (10YR 4/2)
										Sample #6 (12-24")
								Refusal @ 60"		
										East: 597184.5 North: 734396.0
										Core Barrel Advanced: 60" Recovery: 38"

R2-0007601

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-14B	20050738		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	2.38%	%
DC-14B	20050738		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	63.25%	%
DC-14B	20050738		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	20.95%	%
DC-14B	20050738		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	13.42%	%
DC-14B	20050738		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	38.4	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	99.57%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	97.62%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	95.86%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	89.02%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	74.71%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	58.56%	%
DC-14B	20050738		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	52.91%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.034279	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022156	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013022	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009235	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006587	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003273	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001375	mm
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	34.02%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	26.80%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	20.62%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	19.59%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	16.49%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	11.34%	%
DC-14B	20050738		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	8.25%	%
DC-14B	20050738		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	44.96	%
DC-14B	20050738		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	35.15	%
DC-14B	20050738		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	9.81	%
DC-14B	20050738		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	45.37	%
DC-14B	20050738		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	35.15	%
DC-14B	20050738		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.965	
DC-14B	20050738		6/8/2005	EPA 9060	TOC	TOC	Total Organic Carbon	54,293	ppm
DC-14B	20050738		6/8/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	5.43	%

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
14C
Time: 0927

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/6/2005
JOB NUMBER:	3473007	LOCATION:	Mile 14
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
No.	Depth	Rec	Blows per 6"				
1	0-11"			0-11"	Silty Sand and Gravel	SM	Brownish Gray (5YR 4/1)
2	11-18"			11-18"	Poorly Graded Sand with Gravel Lump of Silt Found @ 16"	SP	Grayish Brown (5YR 3/2) **Sample #5 (11-18")**
					Refusal @ 30"		
							East: 597261.4 North: 734380.2 Core Barrel Advanced: 30" Recovery: 18"

R2-0007603

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-14C	20050739		6/29/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	52.17%	%
DC-14C	20050739		6/29/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	45.04%	%
DC-14C	20050739		6/29/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	1.27%	%
DC-14C	20050739		6/29/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	1.51%	%
DC-14C	20050739		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	11.2	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	93.66%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	82.02%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	71.75%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	57.57%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	47.83%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	31.55%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	22.97%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	18.15%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	17.01%	%
DC-14C	20050739		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	16.48%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037197	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023513	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013619	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009630	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006810	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003345	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001397	mm
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	5.05%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	5.25%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	4.04%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	4.04%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	4.04%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	3.03%	%
DC-14C	20050739		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	2.02%	%
DC-14C	20050739		7/13/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-14C	20050739		7/13/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-14C	20050739		7/13/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-14C	20050739		7/13/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-14C	20050739		7/13/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-14C	20050739		7/13/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.648	
DC-14C	20050739		6/8/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,030	ppm
DC-14C	20050739		6/8/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.10	%

<1> Sample did not exhibit plastic qualities due to amount of gravel and sand present.

R2-0007604

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
15A
Time: 1230

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/3/2005
JOB NUMBER:	3473007	LOCATION:	Mile 15
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
								No Recovery After 3 Attempts		East: 597601.9 North: 738275.2 Core Barrel Advanced: 12" Recovery: 0

R2-0007605

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
15B
Time: 1420

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/3/2005
JOB NUMBER:	3473007	LOCATION:	Mile 15
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-21"						0-21"	Poorly Graded Fine-Medium Sand w/Gravel	SP	Brownish Gray (5YR 4/1) **Sample #3 (6-20")**
								Refusal @ 36"		
										East: 597642.7 North: 738248.7 Core Barrel Advanced: 36" Recovery: 21"

R2-0007606

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-15B	20050730		6/24/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	61.87%	%
DC-15B	20050730		6/24/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	35.83%	%
DC-15B	20050730		6/24/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	0.40%	%
DC-15B	20050730		6/24/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	1.90%	%
DC-15B	20050730		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	11.5	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	95.32%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	81.42%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	67.00%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	38.13%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	17.98%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	14.53%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	13.44%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	12.41%	%
DC-15B	20050730		6/27/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	11.90%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.037197	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023652	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013655	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009656	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006828	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003345	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001394	mm
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	11.11%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	8.08%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	8.08%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	7.07%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	6.06%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.06%	%
DC-15B	20050730		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	6.06%	%
DC-15B	20050730		7/12/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-15B	20050730		7/12/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-15B	20050730		7/12/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-15B	20050730		7/12/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-15B	20050730		7/12/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-15B	20050730		7/12/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	1.369	
DC-15B	20050730		6/7/2005	EPA 9060	TOC	TOC	Total Organic Carbon	8417.6	ppm
DC-15B	20050730		6/7/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.84	%

<1> Sample did not exhibit plastic qualities due to amount of gravel and sand present.

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
15C
Time: 1320

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/3/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 15**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-6"						0-6"	Sandy Leaf and Organic Debris	OL	Grayish Brown (5YR 3/2)
2	6-36"						6-36"	Poorly Graded Silty Sand	SM	Grayish Brown (5YR 3/2)
3	36-52"						36-52"	Silt with Fine Sand (<15% Sand)	ML	Very Dark Brown (7.5 YR 2/2) **Sample #4 (32-40")**
4	52-58"						52-58"	Sandy Leaf and Organic Debris	OL	Grayish Brown (5YR 3/2)
								Refusal @ 72"		
										East: 597711.3 North: 738184.1 Core Barrel Advanced: 72" Recovery: 58"

R2-0007608

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-15C	20050731		6/24/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	0.00%	%
DC-15C	20050731		6/24/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	59.48%	%
DC-15C	20050731		6/24/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	23.23%	%
DC-15C	20050731		6/24/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	17.29%	%
DC-15C	20050731		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	40.9	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	100.00%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	100.00%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	100.00%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	99.78%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	99.13%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	95.84%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	77.60%	%
DC-15C	20050731		6/29/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	58.12%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.033731	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022021	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.012946	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009235	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006587	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003255	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001367	mm
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	41.24%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	30.93%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	24.74%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	21.65%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	18.56%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	15.46%	%
DC-15C	20050731		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	12.37%	%
DC-15C	20050731		7/12/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	36.54	%
DC-15C	20050731		7/12/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	30.37	%
DC-15C	20050731		7/12/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	6.17	%
DC-15C	20050731		7/12/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	39.51	%
DC-15C	20050731		7/12/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	30.37	%
DC-15C	20050731		7/12/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	0.867	
DC-15C	20050731		6/7/2005	EPA 9060	TOC	TOC	Total Organic Carbon	56,909	ppm
DC-15C	20050731		6/7/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	5.69	%

R2-0007609

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
16A
Time: 1030

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/3/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 16**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-6"						0-6'	Poorly Graded Gravel w/Silt and Fine Sand (~25% Fines)	GP	Large Dia. Gravel up to 3"
2	6-22"						6-18"	Clayey Gravel w/Fine-Medium Sand	GC	Inadequate Recovery Volume for Sample Collection.
								Refusal @ 36"		
										East: 599490.3 North: 740870.3
										Core Barrel Advanced: 36" Recovery: 18"

R2-0007610

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
16B
Time: 1125

PROJECT NAME:	Lower Passaic River Geotechnical	DATE:	6/3/2005
JOB NUMBER:	3473007	LOCATION:	Mile 16
DRILLING FIRM:	Aqua-Survey, Inc.	WEATHER:	Clear and Hot
DRILLING METHOD:	Vibracore	ELEVATION:	N/A
DRILLER:	Mark Padover	DATUM:	NAD83
HELPER:		HYDROGEOLOGIST:	D. Auld

SAMPLE INFORMATION									USCS	
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	Lithology	REMARKS
1	0-6"						0-6'	Silty Gravel w/Sand, poorly Sorted (<15% Fines)	GM	Medium Bluish Gray (5B 5/1)
2	6-22"						6-22"	Sandy Organic Sediment w/Gravel (~20% Gravel)	OH	Brownish/Gray (5YR 4/1) **Sample #2 (6-22")**
								Refusal @ 36"		
										East: 599552.7 North: 740883.7
										Core Barrel Advanced: 36" Recovery: 22"

R2-0007611

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-16B	20050728		6/24/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	3.28%	%
DC-16B	20050728		6/24/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	60.67%	%
DC-16B	20050728		6/24/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	22.12%	%
DC-16B	20050728		6/24/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	13.93%	%
DC-16B	20050728		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	17.0	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	100.00%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	99.50%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	98.08%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	96.72%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	95.29%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	93.14%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	91.39%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	89.52%	%
DC-16B	20050728		6/27/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	70.51%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.033286	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.022356	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013136	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009369	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006662	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003273	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001367	mm
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	44.44%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	25.25%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	19.19%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	16.16%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	14.14%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	13.13%	%
DC-16B	20050728		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	12.12%	%
DC-16B	20050728		7/11/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-16B	20050728		7/11/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-16B	20050728		7/11/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-16B	20050728		7/11/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-16B	20050728		7/11/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-16B	20050728		7/11/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	I.S.	
DC-16B	20050728		6/7/2005	EPA 9060	TOC	TOC	Total Organic Carbon	576.2	ppm
DC-16B	20050728		6/7/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.06	%

<1> Sample did not exhibit plastic qualities due to fine sand content passing #40 sieve.
I.S. = Insufficient Sample

MALCOLM PIRNIE, INC.

17-17 ROUTE 208 NORTH, FAIRLAWN, NEW JERSEY 07410

BORING:
16C
Time: 1104

PROJECT NAME:	**Lower Passaic River Geotechnical**	**DATE:**	**6/3/2005**
JOB NUMBER:	**3473007**	**LOCATION:**	**Mile 16**
DRILLING FIRM:	**Aqua-Survey, Inc.**	**WEATHER:**	**Clear and Hot**
DRILLING METHOD:	**Vibracore**	**ELEVATION:**	**N/A**
DRILLER:	**Mark Padover**	**DATUM:**	**NAD83**
HELPER:		**HYDROGEOLOGIST:**	**D. Auld**

SAMPLE INFORMATION										
No.	Depth	Rec	Blows per 6"				Depth	SOIL DESCRIPTION	USCS Lithology	REMARKS
1	0-6"						0-6"	Silty Gravel w/Sand (<15% fines)	GM	Brownish/Gray (5YR 4/1)
2	6-22"						6-22"	Poorly Graded Sand w/Some Fine Gravel and Silt	SP	Brownish/Gray (5YR 4/1) **Sample #1 (6-22")**
								Refusal @ 30"		
										East: 599585.0 North: 740892.3 Core Barrel Advanced: 30" Recovery: 22"

R2-0007613

Sample ID	Lab Sample ID	SDG	Analysis_Date	Analysis Method	Analysis Method Description	Cas No/Param_Code	Description	Results	Units
DC-16C	20050729		6/24/2005	ASTMD422	Particle Size Analysis	%_GRAVEL	%_GRAVEL	68.73%	%
DC-16C	20050729		6/24/2005	ASTMD422	Particle Size Analysis	%_SAND	%_SAND	28.08%	%
DC-16C	20050729		6/24/2005	ASTMD422	Particle Size Analysis	%_SILT	%_SILT	1.18%	%
DC-16C	20050729		6/24/2005	ASTMD422	Particle Size Analysis	%_CLAY	%_CLAY	2.01%	%
DC-16C	20050729		6/17/2005	ASTMD2974	Moisture Content	%_MOISTURE	%_MOISTURE	11.4	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_1in	% passing 1"	100.00%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_3/4in	% passing 3/4"	76.81%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_3/8in	% passing 3/8"	43.11%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_4	% passing #4	34.12%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_10	% passing #10	31.27%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_20	% passing #20	26.58%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_40	% passing #40	19.51%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_60	% passing #60	15.44%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_100	% passing #100	13.32%	%
DC-16C	20050729		6/27/2005	ASTMC136	Sieve Analysis	SA_200	% passing #200	12.11%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS2min	Largest diameter of particle in suspension at 2 minutes	0.036794	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS5min	Largest diameter of particle in suspension at 5 minutes	0.023462	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS15min	Largest diameter of particle in suspension at 15 minutes	0.013546	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS30min	Largest diameter of particle in suspension at 30 minutes	0.009604	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS60min	Largest diameter of particle in suspension at 60 minutes	0.006810	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS250miin	Largest diameter of particle in suspension at 250 minutes	0.003336	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_LDIS1440min	Largest diameter of particle in suspension at 1440 minutes	0.001390	mm
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat2min	% finer than diameter calculated at 2 minutes	11.11%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat5min	% finer than diameter calculated at 5 minutes	8.08%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat15min	% finer than diameter calculated at 15 minutes	8.08%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat30min	% finer than diameter calculated at 30 minutes	7.07%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat60min	% finer than diameter calculated at 60 minutes	6.06%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat250min	% finer than diameter calculated at 250 minutes	6.06%	%
DC-16C	20050729		6/14/2005	ASTMD422	Hydrometer Analysis	HA_%FTDat1440min	% finer than diameter calculated at 1440 minutes	6.06%	%
DC-16C	20050729		7/12/2005	ASTMD4318	Atterberg Limits	AL_LL%M	Liquid Limit	<1>	%
DC-16C	20050729		7/12/2005	ASTMD4318	Atterberg Limits	AL_PL%M	Plastic Limit	<1>	%
DC-16C	20050729		7/12/2005	ASTMD4318	Atterberg Limits	PI	Plasticity Index	<1>	%
DC-16C	20050729		7/12/2005	ASTMD4318	Atterberg Limits	AL_LLMC	Liquid Limit Moisture Content	<1>	%
DC-16C	20050729		7/12/2005	ASTMD4318	Atterberg Limits	AL_PLMC	Plastic Limit Moisture Content	<1>	%
DC-16C	20050729		7/12/2005	ASTMD4531	Bulk Density	BULK_DEN	Bulk Density in grams/milliliter, dry recovery	I.S.	
DC-16C	20050729		6/7/2005	EPA 9060	TOC	TOC	Total Organic Carbon	1,729	ppm
DC-16C	20050729		6/7/2005	EPA 9060	% TOC	TOC_%DW	% Total Organic Carbon of dry weight	0.17	%

<1> Sample did not exhibit plastic qualities due to amount of gravel and sand present.
I.S. = Insufficient Sample